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JUNE, 1947

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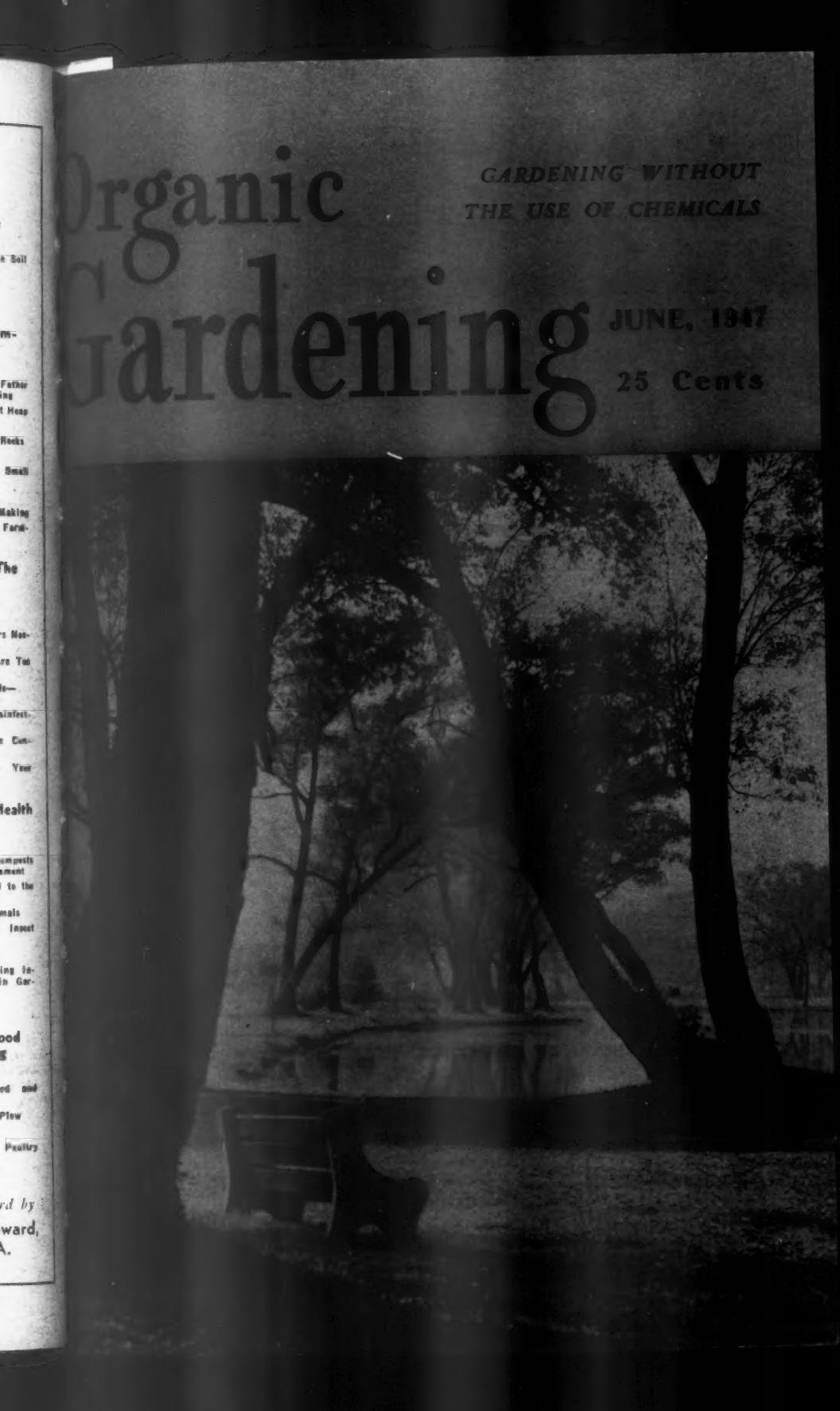

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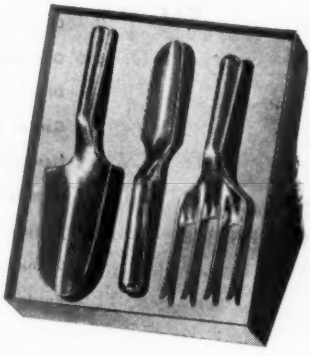

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Gladys R. Graham,
Box 789, Balboa, C. Z.

—o—

COST FIGURES

I had a friend who had good success growing cabbage by using wood ashes to dust over it which seemed to help in keeping worms and insects off it. What do you think of that? I have not tried it but since I learned of it I have sifted and bagged some wood ashes to be used for anything which might prove helpful. I wonder if wood ashes perhaps in combination with tobacco dust and perhaps dusting sulphur or lime might prove helpful toward the control of insects or disease on plants or vines. Please suggest.

We have not had very good success using the tobacco dust for the control of leafhoppers on our grapes, we had to resort to nicotine spray in liquid form.

At this time I shall give you a very brief reply to a letter which I received from you in July 1945. This is regarding a grape vineyard which I planted in Jan. 1939 (1000 vines), I now have more than 3600 vines in vineyard, and will have more than 100,000 vines for

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sale this fall. I have not used any fertilizer at all on anything I have except my first vineyard (1000 vines) more than four years ago. I also have some apples and peaches.

I have been selling all my grapes as fancy fruit to a Wholesale Grocery Company, last summer we had 12,538 pounds which brought $1925.20, wholesale. I have had visitors from all parts of this State and everyone says that my grapes are the best they have ever tasted. I just tell them they have not had a bit of fertilizer, you should see them open up their eyes, and say what, no fertilizer, how do you raise them? I tell them just by common sense and a little of our natural resources thrown in, and together with what they have thrown away.

I have about thirty varieties of grapes, am still adding new ones, trying out to see what does the best here in this State. This is the Piedmont (or middle section) of N. C. Last fall I planted a vineyard for one man consisting of more than 8200 vines. Also sold another man 10,000 vines of one variety (Fredonia). The grape is the surest fruit crop we have. I have received much publicity throughout the state, especially through our State Agricultural Department. I have an absolute accurate expense record of everything I have spent and made on my small place of 48 acres. But there wasn't a thing there to begin with in 1938.

I certainly enjoy your magazine, and will be glad to give you any information about my place you care to have and assure you that I will appreciate anything you can tell me about the care of fruits or vegetables.

Rose City Nursery,
Ira H. Bost, Owner,
Maiden, N. C.

—o—

THE TRADING POST

From my ad printed last February looking for a farmer to ship organic vegetables I got a dozen replies and three farmers nearby. Mr. Chamber-

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Robert Valverde,
New York City

—o—

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The possibility of using the discharge from a *Disposall* on a compost is very interesting. We have this thought brought to our attention a number of times and have made some preliminary investigation.

The only thing that seems to stand in our way is the cost of the necessary plumbing by-pass and the problem of keeping the discharge line from freezing in the winter time.

The amount of material discharged will amount to one-fifth of a pound of dry solids per day per person or approximately one pound of dry solids per day for an average family. It is quite possible that someone may set up a Disposall some one of these days with a discharge line running to the compost. However, the number of these applications will be very very small.

Generally speaking, the Disposall will be used to take advantage of the water-borne method of removal of organic waste from the premises.

G. H. Roney,
General Electric Co.,
Bridgeport, Conn.

—o—

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fruit set. The trees look far better than they ever did with fertilizer. We noticed one peculiar thing, on the Valencia oranges which are a late orange. When they were green on the outside, the inside was ripe and very sweet. We showed a few oranges to Dr. Wilkins and he seemed to think it was the compost. We hope so as that means we can ship the whole crop early to Havana.

We have another grove of 1,000 trees —part oranges and part grapefruit. We are giving them a small amount of fertilizer and will give them compost later as we have not enough made to supply them.

We have a younger grapefruit grove of 700 trees and expect to use compost on them and no fertilizer. We used compost on part of them and fertilizer on the rest and the compost is decidedly better.

On the grove which has only compost we have a big crop set and the grove which has had fertilizer and no compost we have only half a crop. We cannot figure why we have to wait from 5 to 10 years before changing from fertilizer to compost. To play safe we will give them a little fertilizer this fall but only a little. Fertilizer costs $65 a ton at the dock, and to buy the proper amount for our groves for one year would cost us $2,000 and we don't believe compost would cost over $500.

We expect to make at least 100 tons this year—in fact we have enough on the way to make half of that now.

Yours sincerely,

Jardine Brothers,
Isle of Pines, Cuba

—o—

CHANGE IN PEACHES

I am very much interested in your articles pertaining to chemicals. I live in S. W. Arkansas, the home of a million peach trees. At one time peaches were produced nearly as large as saucers. That was when this district was

in its infancy. But Johnson was founder and he always used lime to sweeten the soil, later the peach industry was commercialized. We use chemicals in fighting disease and I do not believe that it has done one bit of good. Still we use it but *we* are now going to start out on "compost" and see what can be accomplished. We have used so many chemicals that we do not have bees to pollinate, and therefore no fruit. Chemicals and fertilizers are taking the profit from the peach industry—or at least that happens in our case. We have 94 acres in peaches.

Miss Montie Sullwan,
Nashville, Ark.

—o—

COMPOST IN MAINE

If I had not had an experience with some beans I planted last year, I would not have believed that compost would keep away bugs.

Otis R. Dow,
26 Eastern Ave.,
Boothbay Harbor,
Maine

●

Each month, *Organic Gardening* publishes a worthwhile garden book, specially written or newly issued. On May 15, Cecile Hulse Matschat's *Bulbs and House Plants* came off the press. If there were nothing in that book except the charts of tulips, lilies, iris it would be worthwhile to the gardener. On one page, for example, four different groups of peonies are admirably discussed, which will give the garden

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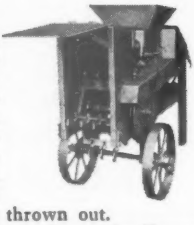

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lover, who is not a peony specialist, a fine survey of possibilities with this useful, reliable, and often so fragrant flower.

While this is not the time to consider the indoor garden at length, we must now take the house plants out and give them natural growing conditions in the open. Enough hints are contained to make anyone succeed with house plants. When to buy them, how long to keep them cool or dark, how much light to give them, what moisture requirements to observe, how to watch for heating—these are some of the questions answered. While Miss Matschat is not an organic gardener she has a great reputation as a flower garden expert; still the organic gardener can easily translate her recommendations into organic terms, a matter which is particularly simple with these kinds of plants.

For, many bulbs, especially the lilies, must be given organics in quantity; and even the professional greenhouse man likes to rely on bone meal and horn dust for his phosphorus and nitrogen supply to house plants. We consider the book useful and therefore reissued it. The first number of the next series will be *Organic Fertilizers,* written by the Staff of *Organic Gardening.*

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Compost Quiz

Mark the statements below RIGHT or WRONG, then turn to page 59 and check the answers. If eight are answered correctly you are a pretty good composter.

1. It does not matter how much manure is used in a compost pile.
2. Straw is better than fresh plant material.
3. The Indore process is so called because one can use it indoors.
4. A compost heap heats after every turn.
5. There is only one kind of compost which all plants like.
6. Grubs are good for the composting process.
7. Bone meal should not be used in composting.
8. Superphosphate is the same as phosphate rock.
9. Use plenty of lime in the compost heap.
10. A thin sprinkling of earth is all that is needed on top.

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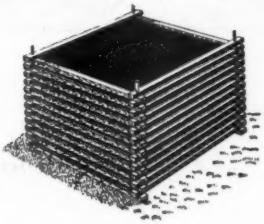
Designed by J. I. Rodale. Described in Organic Gardening, Dec. 1946, Page 9.



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A Discussion With A Botanist

IT was a pleasure a few weeks ago to meet Dr. Howard E. Pulling, professor of botany at Wellesley College. Dr. Pulling is an ardent reader of *Organic Gardening* and feels that the use of chemical fertilizers is fraught with danger. As we gazed out of his window onto the beautiful campus he said, "Note the shape of the trees. As a whole they look beautiful, but you will see that there are mighty few of them that are growing straight. There is a reason. The bacteria that are important in the soil in that they contribute to the well-being of the plant, are for the most part bacteria that form no spores. Hence they could not blow about as dust and remain alive. That is one reason, I am convinced, that we are having so hard a time with our soil here in eastern Massachusetts. Destructive farming, burning of grassland, brush fires, forest fires, over and over again for years and years have finally about wiped out the bacteria in the soil. The forests do not produce humus and even trees can't grow straight."

Dr. Pulling drew attention to a simple experiment that is performed by the botany students at Wellesley that shows the adverse effect of commercial fertilizers on seedlings. "Plant some seeds in sand," said Dr. Pulling, "at such depths that some cotyledons can reach the surface first, later others, still later others. Have several sets of these. To one set add no commercial fertilizer, to the second add a little, to the third, a little more, etc., so that you go up to say four times the amount of fertilizer that the agronomists would recommend but not far enough so that osmotic effects amount to anything. Now determine the time that elapses between the time the cotyledons begin to unfold until they are unfolded, the time until the first true leaves can be seen and the time until the second true leaves can be seen.

"Use seeds like buckwheat or radish that have enough stored food for their needs but that are not so well-developed in the seed, as for instance beans. You will see that the fertilizer retards the plant in making its adjustment to being a self-supporting organism. There is a lot more that can be learned from seedlings than is commonly thought. I have never done this, but I think that it would be instructive to do it. Analyze the compost you use for N.P.K. (nitrogen, phosphorus, potash) which is all that these fertilizer people say is important until the seedling has exhausted the supplies of the rare elements that are in its seed. Then make an artificial medium that parallels the compost in proportions and

total quantities. See the time lapse as above for the seedling.

"Do you know Rayner and Neilson-Jones "Problems in Tree Nutrition?" There is some extraordinarily good experimentation in that, experiments much like that just mentioned for tree seedlings. They got official analysts to tell them what was in the compost and what the synthetic mixture should be. Compost won hands down."

Dr. Pulling continued. "The physical chemistry and the organic chemistry of organisms and particularly of societies or associations of organisms is so complex that we are only at the fringes of it, but we do know a great many things (reactions, conditions for reactions, etc.) with considerable accuracy. On the other hand, if we do not state our knowledge very carefully, we are almost certain to say something that is not true. The fact is, that no one knows, except in a very general way, what plant or animal nutrition really is like, or why or how one organism prefers or rejects another. These things are just as subtle as why two particular people fall in love: you can't explain it. You can't explain why the baby that needs lime will pick off the wall paper and eat the plaster under it. How does the baby know it needs lime? Its parents wouldn't know in their own case. How does it know that there is lime under the paper? Of course it doesn't "know" in the intellectual sense, but there is so much truth in the statement that a healthy baby is able to correctly choose its own food that a child-physician always takes the baby's choice into consideration. Why do some insects always attack the plant at a particular place? How does it know the second leaf from the third? It is interesting, important, and helpful, to find out all that we can on such matters, but, every time the scientific world has set the whole thing forth as a guiding pronouncement it has been wrong. During my life I have seen explanations that seem obvious and incontrovertable proved to be wholly wrong, over and over again.

In discussing the difference between nitrogen in humus and nitrogen in an artificial fertilizer Dr. Pulling said, "From the standpoint of theoretical chemistry I say that the nitrogen is not the same in the two cases. On the other hand, one does not mean to say, really, that the nitrogen is different. The real point is: is the effect on the clover or the bean plant the same when it has healthy, functioning nodules and when it has no nodules and it receives its nitrogen from nitrate salts? And the answer is easily discovered. Of course there is a difference and a big one. Then comes the question, does it make any difference to crops that follow the clover whether you give them nitrate compounds or let them get their nitrogen from what was left in the clover roots? And that answer is easily discovered and is a matter of record: the effect of the clover with healthy nodules lasts for several crops, and that is not true if the clover had only compounds of nitrate. It is even true that the other crops are better than they would be if you fed the clover nitrates and fed the other crops nitrate too. Mind, I am not talking about *yield*, for you can't tell from the size of the plant or the crops whether or not it is a good one. Perhaps you can remember when babies raised on the first wholly synthetic formula took all the prizes at the baby shows. They were big, happy, contented babies. Pictures of them were in all the magazines. But they all had rickets and that was discovered when the babies got older. If it were plants, people would say that they "lodged" or whatever, because the weather was too wet, or too cloudy, or (since probably another organism would have detected the weakness and attacked them) because they "got" a disease."

Dr. Pulling stated that his interest in "organics" dated from way back. "In 1904," he said, "I started teaching in a country school in Wisconsin. I was brought up in town, but I knew woods. Really knew them and could live in them. When I entered High School, I could take a little tea and a little salt and a bow and arrow and go

out in the woods for a day or a month, even in winter. Could and did. So, while I knew outdoors, I did not know farming. Yet I was required to teach agriculture from a text book that was provided. One of the points was: farmers must be taught to spray potato plants against potato bugs. So I taught it. The farmers began to complain. Potato bugs don't hurt potatoes they said. So I told them that I didn't know, I merely did what I was required by law to do. But I would ask. So at the next county teacher's meeting I asked. They said, "These farmers are ignorant. They think that because the potato bugs eat the leaves and the farmer wants the tubers, that the potato bugs don't hurt the tubers. Tell them about photosynthesis etc." So I did. They said, "Yes, city folks think we know nothing. But come over to Ed Esser's place and we'll show you. He sprays half his field this year and the other half he doesn't." You couldn't tell which was which.

"Now this was in a soil that came from the activities of good hardwood trees. All you had to do to get a crop was to girdle the trees and throw the seed on the ground—maybe walk on it or kick stuff over it. I don't maintain that this could be true everywhere. But you couldn't see any difference in the potato plants. It was new soil. Everyone was living in a log house. The axe was in the woods all the year round. Now, they spray and potato bugs eat them up. Why, if artificials are so good? I know an old man in the State of Maine. He has lost about all he ever had except some pretty poor land in among huge boulders and rocks. Among other things he raises potatoes. He is too poor to buy lime. He is too poor to buy anything that isn't an essential. His house burned down. He lives in a house that he built out of the partly burned boards. So, there has been no spraying. You will see a few potato bugs on his plants, but they don't hurt the plants. He clears a patch of brush, which takes him years to clear any considerable area. But his potato patch stays about the same size. As he clears new brushland, he lets former potato fields grow up to brush. He rotates farms not crops. Always new land. A quarter of a mile away they are eaten up by potato bugs in spite of sprays."

Dr. Pulling described the sad history of a small town in Maine that was ruined by a too heavy dose of commercialized farming. A long time ago it was a thriving town of over 2000 souls. Today it doesn't have 200. A starch factory had been started which made its product from potatoes. Every farmer began to grow potatoes on a large scale. This is a crop, as you know, which is a heavy feeder, like corn. It should be grown under careful conditions of crop rotation, but they were anxious to get the checks from the starch factory. Potatoes were grown too often in the rotation. There wasn't sufficient manure, and unusual quantities of commercial fertilizers were therefore used. The soil lost its structure and would blow easily. Soon the yields began to drop alarmingly. Eventually the point was reached that it didn't pay to cultivate the land, and now it is a ghost town. No amount of chemical fertilizers was able to bring about the necessary, paying yields. There are no more checks coming from the starch factory.

Not only was the land ruined, but the inhabitants were raising their own food crops in a terribly devitalized soil, where the bacteria and other beneficent microbes were at a minimum. This must have reflected itself in poor health for the people. When people become possessed with money greed, they do not heed logic. Let us look at this whole problem of human health and its connection with the soil in its most spiritual and logical aspects, else our national monetary income will eventually dwindle to that of a tenth rate nation, not unlike that little tenth-rate, ghost town in Maine.

Thank you, Dr. Pulling, for a splendid and instructive visit. Come and see us sometime at Emmaus.

J. I. RODALE

The Leguminous Crop

SIR ALBERT HOWARD, C.I.E., M.A.

THE role of the leguminous crop in agriculture is everywhere understood and welded into local practice. Nevertheless outside the Far East one of the essential needs of this group of plants is not realized.

To express themselves fully as producers of seed, fodder or forage leguminous crops must, as a general rule, be grown in soil enriched with farmyard manure, or better still with high quality compost. If this condition is not fulfilled trouble of some kind often results. The yield of seed may fail, the crop may become sick, as in red clover, and fade out altogether.

Legumes are invariably sensitive to soil conditions. A careful observer in the West Country, Mr. F. Newman Turner, recently informed me that the honey bee is able to distinguish between two bean crops of the same variety grown side by side on the same type of humus-filled land—one sown with seed raised with farmyard manure, the other with the help of artificials. The bees worked over the former and a good crop of seed was obtained. They avoided the latter and little seed was produced. Obviously some important factor in the nutrition of the bean was conveyed from manure of animal origin to the flower, then to the seed and finally to the following crop.

The cultivators of the Far East know the value of farmyard manure for raising seed of this group of plants. So did our grandfathers who invariably manured the land with ample muck if a good crop of clover hay followed by a second crop of seed was required.

But towards the end of the last century agricultural science intervened and insisted that such manuring of the leguminous crop was unnecessary as the organisms in the root nodules would not only fix all the nitrogen these crops required but would also add to the store of residual nitrogen in the soil. This advice was based on the work of the Bernberg Experiment Station where it was proved that the root nodule fixes free atmospheric nitrogen. By such means nitrogen starvation is indeed prevented but this is only one factor in a much larger problem. The mistake our agricultural instructors made was to argue from the particular to the general without first of all ascertaining the real needs of the leguminous crop.

Any farmer can satisfy himself about the limitations of the nodule factor by growing a crop of alfalfa in a soil rich in properly made compost and top-dressing with the same manure after every cut. There will be few or no nodules on the roots but there will be nothing wrong with the yield or the quality of the produce. The same thing happens when a heavy crop of seed of clover or beans is raised by organic farming methods.

The root nodule begins to fade from the picture the moment the humus content of the soil is increased.

A question will at once be asked—Could not seed formation be improved by the use of artificial manures? The answer is that the plant objects. Anybody can verify this by trying to grow a crop of beans on strong land with the help of such artificials.

Besides supplying the protein needed by man and beast several leguminous crops, like ground nut and soya bean, produce oil as well. Much of the oils and fats now in such short supply in Great Britan come from the ground nut.

To increase the supply of oils and fats an interesting development in Tanganyika, Southern Rhodesia and Kenya is in progress*. An area of some 3,210,000 acres, sub-divided into 107 units each of 30,000 acres, is to be cleared of forest, scrub and grass and put under ground nuts. It is expected to produce from 600,000 to 800,000 tons a year by the help of mechanized cultivation, the use of a rotation crop of grass to provide organic matter, and plenty of artificials to stimulate the ground nuts. It is not proposed to introduce livestock on account of the danger of tsetse-fly infection. These parasites are now in possession of most of the wooded areas which have to be cleared, but it is hoped with the help of entomologists that this adverse factor can be controlled.

The usual procedure in such developments as this is to begin in a modest way and to write the preliminary results on the land itself. This provides the necessary time and experience before any subsequent large scale developments are attempted. But the need is so urgent that it has been decided to risk proceeding straight from the paper project to the unit of 30,000 acres.

Such large scale farming schemes by means of tractors and the manure bag and without the help of livestock are not new. They were tried in Russia after the Revolution but were soon given up. In Africa the Empire Cotton Growing Corporation attempted to produce cotton without farmyard manure but the results have not been impressive. The tea planters in Nyasaland and Kenya began to grow tea with the help of artificials, but they soon had to maintain cattle for the sake of their manure.

It will be interesting to watch this new African development in the culture of a leguminous crop and to see for how long the crucial result—the setting of seed—can be maintained without farmyard manure. It is an excellent method of putting the new slogan of the vested interests—*organic matter supplemented by artificials*—to the long term acid test.

**A Plan for the Mechanized Production of Ground Nuts in East and Central Africa,* Cmd. 7073, H. M. Stationery Office, London, 1947.

Memorandum

To Our Readers:

I want to personally thank the many readers who take the trouble of sending us clippings from newspapers and magazines that they think would be of interest to us. In this way we keep in touch with developments all over the country. This is a very valuable work and we trust that the readers will continue to cooperate in this wonderful fashion. Looking at our mail every day is a thrill because there is always something in it which shows that the organic method is spreading.

J. I. RODALE

ORGANICS IN ARIZONA

Our soil is, or was, a very heavy clay, which when wet was very sticky, so much that it was very difficult to get it off from shoes or tools. And it would pack very hard when dry, and was almost impossible to spade, and when spaded it would break up in large clods almost as hard as an adobe. And it was very hard to crush or break up, and hard to get a stand of anything, as the seedlings could not force their way through the hard crust which would form on top the ground.

I got the idea, from "Five Acres and Independence," to mix sand with the clay to improve its texture. I immediately made a compost heap according to your instructions and while it was curing I trenched my garden two spades deep, putting straw and a small amount of cow manure in the bottom of the trench, placing the subsoil on this straw, then putting the top soil back in place. Then I put a couple of inches of sharp sand on top, then when the compost was ready, I gave it a dressing of compost and spaded it under. This was done in July and August, and in September I planted a variety of vegetables, including some Purple Top Turnips. One turnip measured 28⅜ inches in circumference and weighed 12 pounds and 6 ounces and was solid throughout, and as sweet and tender as any turnip I have ever eaten. The peas, carrots, radishes and beets are the sweetest it has ever been my pleasure to eat, and the flavor is superb.

Many people from this neighborhood, as well as some from New Mexico, Texas, Wyoming, Nevada and California who have eaten my vegetables all say the same thing. One neighbor from Montana comes real often for some beets. He says that he thought the best beets on earth grew in Montana, but never before in his life has he eaten beets that were so sweet and with such a delicious flavor. And I defy anyone to produce a more delicious chard. Thanks to "Organic Gardening".

Last month I gave the garden another dressing of about 1½ or 2 inches of good sharp sand also a good dressing of compost. Now the soil spades nicely and is much more friable and easy to handle. Can get a nice seed bed, and plants seem to have no difficulty in coming up.

Geo. F. Sevey,
Secretary-Treasurer
The Victory Mining Co.,
Clifton, Arizona

•

INTELLIGENCE FROM INDIANA

Where my garden is located was once the bottom of Lake Michigan and everything is sand, soil for lawns and gardens has to be hauled in. I built a new home 8 years ago and have had a garden since then, after a fashion.

Up until the time I subscribed to Organic Gardening I preached adding chemicals and more chemicals to the soil to replace those taken out by growing plants. I have a brother-in-law living a mile south of me who was born in Europe and I tried for years to convince him that it was no use trying to raise vegetables and fruit without commercial fertilizers but he just laughed at me and put dirty manure and leaves on his soil in the fall.

Then gradually I began to wonder

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why his soil seemed to improve in texture and the fruit and vegetables were of the best quality and bore heavily while my soil became cold and hard to manage and every year I had to use more and newer sprays and dusts in order to keep the bugs and disease from consuming everything.

I really began to wonder when I took several bags of well fertilized grass clippings from my lawn to give his chickens and they refused to eat them but they did eat his grass just 5 minutes later.

After one season of practising organic methods as recommended by Organic Gardening Magazine the improvement is hard to believe, not only vegetables but flowers, roses, shrubs and trees all showed a remarkable improvement and my spray and dust guns only gathered dust last year.

For the first time in 4 years I had a good crop of Glads with perfect flowers (they were usually disfigured by thrips in spite of all known treatment). I still have canned carrots, baby beets, tomatoes, green and wax beans from last years garden and there is no commercial canned or fresh vegetable that we have tried that comes close where flavor is concerned.

James L. Stull,
4131 Wegg Avenue,
East Chicago, Indiana

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NEWS FROM MINNESOTA

Organic Gardening continues to give me valuable information for the gardens on my two acres. I used hen house wood shavings litter which was about four years old. The shavings and manure were well decayed and had no odor. I grew onions four inches in diameter and blue hubbard squash up to twenty-eight pounds. Other vegetables also produced large crops last summer.

C. A. Koepke,
Como Station R. 5,
St. Paul 8, Minn.

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RESULTS IN CALIFORNIA

What I don't know about gardening would fill volumes. What I do know is that Organic Gardening has proven to me beyond doubt that it is well worth the trouble to make a compost, etc. I have been ridiculed by some of my neighbors in my sincere belief in organic gardening. From the results I am getting (and they are aware of that now) it is now becoming my time to receive respect for my regard for organic gardening.

Harold Lyons,
740 Market Street,
San Francisco, Cal.

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GEORGIA HAS PROOFS

I take a lot of magazines but none of them is like my gardening magazine. I've made two boxes of compost and it is fine, every one wants to know what makes "your flowers grow so much better than mine," and when I tell them, some of them seem to think that is too much trouble, but not me, I love working to make two blades of grass grow where there has just been one. This organic compost is wonderful.

Mrs. L. W. Underwood,
Route 5, Box 294,
Dalton, Ga.

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ARKANSAS IS ENTHUSIASTIC

Also, one of our enthusiastic and fruitful experiences in using God's own and Rodale's own compost methods: We raised prettier-than-seed-catalog tomatoes, asparagus, cucumbers, Irish and sweet potatoes, peppers, beans, et cetera. Our self-grafted pecan trees are leaves, rocks and debris mulched—pecan trees are beauties to behold. All other young nut and fruit trees are composted and rock and leaf mulched to the hilt. Long live Organic Gardening!

Marie D. Adamatis,
Route 4,
Hot Springs National Park,
Arkansas

Roses—Another Case History

By EHRENFRIED PFEIFFER, M. D.

ROSES are sometimes believed to have originated in the mountain areas of Persia and Central Asia, in the cradle of humanity, and descended with man when he populated India, Persia and China.

As far back as one can know they were cultivated in Persia and used for worship and pleasure. They were a luxury that developed tremendously in the past. At festivals the blossoms were spread several inches high on path and floor. Cleopatra, when she was to receive her beloved Antonio, once had rose petals piled on the floor two feet high (more than $1000.00 worth); they were sent by the ship-load from Asia Minor to Rome. To be bedded on roses is an expression that was literally true in those times.

It is almost a wonder then that this plant with its delightful fragrance and beautiful colors in its blossoms has not yet degenerated. It speaks for the vitality of this genus and its inborn life that it survived all the civilizations which it had beautified and which have perished long ago.

In Persia (there are dozens of native American roses, too) they used to grow on clay soils, on mountain slopes, amongst rocks and springs and in the moist air of the mountain valleys and in a location that was not exposed to the direct sunshine all day long; under sheltered conditions, most likely on the borderline of woods and meadows. Wild roses prefer "edges" of woods, of dirt roads and trails, of streams, if the borders are dry and gravelly, but not if they are too moist and swampy. Roses do not like wet feet. They have never become used to that, remembering as an inherited factor the well-drained mountain slope. They still remember the shelter of the mountain sides and it is not without reason that one recently re-discovered that roses in general do better in the protective half-shadow of houses, trees, shrubs in gardens than under direct exposure. Their fragrance is that of mountain air, sheltered from but purified by sunshine. It is the sublimest "distillation" of earthly substance by means of light and warmth which becomes apparent in colors and in aroma. The rose was the symbol of purification, refinement, catharsis.

That roses are "border" line plants between exposure and shelter becomes particularly clear with the climbing varieties such as the Crimson Rambler. These are not true vines like the hops, but have such a vigorous growth of thin, woody stems and branches that they require support or grow prostrate. They climb over rocks, shrubs, trees or, artificially supported, on house walls. In nature they have protection and shelter from the leaves of the supporting shrub—on the house wall they have nothing but the heat and light reflected from the wall. The result is mildew and other diseases, aphis, etc. One of this writer's first consultations in his biological practice some twenty years ago was about a mildew-covered Crimson Rambler on the front of a house. He almost lost his reputation in the beginning; everything was tried from biodynamic compost to non-poisonous organic sprays—the mildew did not yield. There was a naughty branch escaping from the confined area and growing around the East corner of the house. This branch was free of mildew. This writer stood there meditating on how it felt to be squeezed against the wall with east exposure (you get a lot of light but not so much radiated and reflected heat), and how it felt under

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McFarland

The Rose—Top, left to right: Nitida, Macrantha; Bottom: Centifolia, Alba

southern exposure (light, but heat up to sunstroke condition). It was evident what roses preferred and what they disliked. If you have a climbing rose do not expose it to direct and radiating heat reflected from a wall to the south and you will save yourself a lot of trouble. Half-shadow is best for all roses. They will do better on the east and west side of a house.

It is advisable if there is trouble with a plant to say to oneself—Let's find out first about the natural habitat in the original homeland.

Like all low growing shrubs and canes, roses, being borderline plants of woods and meadows, prefer humus or leaf mold as do the strawberries. The amount of manure they can stand is simply marvellous. In rose beds, particularly when the gardener has encountered trouble, cow or horse manure is piled up a foot high. This speaks for the tremendous refining power of the roses that they still smell "rose". And it speaks for that astonishing will to live that roses have withstood all the mistreatment from gardeners. To wit:—They are cultivated on almost every soil nowadays, in every possible combination with other plants. Grown in a commercial scheme for perfume, roses are planted in rows like potatoes and earthed up with a plow. 3200 lbs. of petals are required to produce 1 lb. of pure rose oil. Onions and garlic are planted as intercrops by the peasants of Bulgaria and it has been observed that the rose produces more and stronger perfume when garlic is nearby. This is one of the great mysteries of companion plants.

Most of the rose gardeners, however, might object to growing garlic in between the rose beds and we have to find other means of helping them. There is, besides changing a too exposed position, the soil correction. Originally they preferred clay soil as they still do on the Gulf Coast in the wild. If grown on light, sandy soil, particularly the kind that dries out easily, one can give a compost-manure mixture with clay. In piling up the compost material in layers one inserts alternating layers of clay soil instead of lime. Whoever loves his roses will surely buy a load of clay soil if he does not have it on his land. Should this compost be made up with some onion and garlic refuse, I am sure it would be especially beneficial. Earthworms propagate in such material by the thousand and create just the kind of humus which the roses prefer. It is for this preference of earthworm soil why roses should be given well rotted, composted manure and not fresh. The covering which is needed to protect against drought and cold is done by means of a coarse leafmold or mulching compost.

We always keep two types of compost heaps on hand: One for manuring purposes with all fine and rich materials and one for mulching with coarse, strawy and leafy materials.

Besides the clay compost for sickly roses one can cover the soil around the bushes with clay and even spray an emulsion of clay all over the plant to the extent that all leaves and stems are thoroughly covered. The next rain will wash it off. You will be surprised to see how green the leaves grow under this film of clay. The biodynamic people add a 0.5% tea extract of horsetail (Equisetum) to that clay emulsion (made by ten minute boiling) and claim beneficial effects in case of mildew and other fungus infections. This procedure plus soap water and tobacco extracts (Blackleaf 40) is also good against Aphis.

In case of cold and wet soils and a high water table it is best to keep the roses on raised beds or little mounds.

The pruning or cutting of rose bushes is more or less a question of personal taste and experience. Usually about 50% of the new growth is cut back. In the spring clean out all dead branches and in the fall all badly diseased or unshiny parts. The more wood is left the more flowers will start to grow, but they may be weak because the plant cannot nourish them. If one cuts them down completely only a few, though beautiful, flowers will

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result. It is important that there should be enough leaves in order to collect and store plant food for the coming year. For the same reason there is little sense in piling manure around them; for when winter comes all is washed away by springtime. The best time for manuring is early spring (to push) or late summer (to build up reserves). Some varieties need frost protection. Take care that straw or whatever is used for packing the shrubs is built up vertically, so that water may run down and the "packing" be kept dry. For that reason a coarse mulching of the ground is also preferable. Also take care that the wind does not sweep away your straw mulch.

Once this writer was consulted by a city park gardener who had trouble with his roses (and with the park visitors). The rose growth was weak and the visitors objected to the fresh manure piles which were spread around the rose bushes. After all, they wanted to smell the roses. Mention of the symbiotic effect of garlic did not appeal much, but the gardener was sold right away on the composted manure idea, and made a success of it. However, with some study we discovered two other companion plants that do very well together with roses, improve the soil and soil life, hold the soil moist and sheltered over summer, are beneficial as a covering, and even add to the symphony of smells and colors. One companion plant is mignonette that it is well to use as a low cover and border plant on rose beds, and the other is garden lupins (legumes) which can match the rose bushes in color. Particularly perennial lupins help to improve the soil in nitrogen and earthworms.

There is an antagonistic companion too—the boxwood. According to Versailles garden style, boxwood is used to frame a garden bed. It is cut back every year and kept low. This does not hinder the roots from continuing to grow underneath and to spread out like an iceberg underneath the surface of the water. After five or more years these boxwood borders develop roots like a thick felt and take away all nourishment from the roses. In this case the extending roots of the boxwood have to be cut off, or, the boxwood must eventually be removed. Usually the one who has to give this last radical advice makes himself very unpopular. It is, therefore, much wiser to prevent trouble right in the beginning. That means not to plant roses with other plants with roots of the spreading-out woody type, but only with those of deep-going roots.

Wild roses, the mother plants of all cultivated roses, grow everywhere and have something preserved of their original vitality, even in their chemistry. Their fruit, the hips, are one of the richest sources of Vitamin C. In old peasant farm kitchens in Southern Germany, Alsace and Switzerland there was always to be seen a pot with the seeds on the stove during winter, and a jam made from this fruit was beloved by all children. It was believed that this fruit was particularly good for health and growth.

Had our scientists taken old folklore more seriously the Vitamins might have been discovered fifty years earlier.

Trading Post

A NEW SECTION in our Classified Ad Pages is called The Trading Post. Readers who have things to sell to other readers will welcome this new medium, by which growers can contact consumers and consumers can seek growers. This is an opportunity for organic gardeners and farmers who have overproduction and want to share their good things with others.

H. C. White Photo

THE TWINS ADMIRE A BIG ONE

The writer can just encircle with his arms this huge Navel Orange tree in the Bryn Mwar grove. Note the natural leaf mulch on the orchard floor, and the ancient irrigation ditches, made a quarter of a century ago. You will observe that the grove is absolutely clean of all weed growth. Twin brother Henry on the right, is also an Organic Gardening enthusiast from Michigan.

Frank Hinckley—Rebel

By HERBERT CLARENCE WHITE

TWENTY-FIVE years ago Frank Hinckley, California orange grower extraordinary, was known as "the craziest man in San Bernardino County."

Today his groves are taller, the leaves are a richer, deeper green, and his fruit larger and more abundant than any of the neighboring groves, whose owners still follow "the book" in citrus culture—and his reputation —Well, the neighbors no longer call him crazy; for, according to his own words, "half the growers in San Bernardino County are now following my methods."

Frank Hinckley is a friendly, soft-spoken man, well past middle life. I found him in bed in the spacious living-room of his comfortable country home. He had recently undergone a serious operation, and was recuperating at home following two long months in the hospital. But in spite of his "ups and downs" healthwise, he could still talk; and that was all I wanted (This being my third effort to obtain

an interview with this outstanding Agronomist).

Just outside the city of Redlands, surrounded by his magnificent orange groves, this pioneer in "Organiculture" (he didn't call it that) has demonstrated to a skeptical world that Nature's methods are best. Hinckley's rebellion against the "standard practices" of his neighboring citrus growers is well illustrated by his unique method of dealing with "succors" that grow up in the heart of every orange tree and sap a good deal of the vigor that should go into new growth on the outside fringe of the tree.

This observing farmer noticed that whenever the succors were cut off, new and bigger ones always appeared, and in increasing size and abundance. He also observed that where a succor was allowed to develop naturally on the tree, after a normal period of growth, it became dormant. No further sapping of the "life-blood" of the tree occurred; no new succor growth developed, and all the strength of the life-giving sap went out to the extremities of the tree, where with light and sunshine it could produce a bigger and better harvest.

His Motto is: "Get your tree growing,—and keep it growing." And his revolutionary discovery regarding "succors" always put this new growth in the right places—where it can do the most good in producing a fine big crop. The moral: "Let Nature take her course" when dealing with succors.

"What is the foundation stone of your 'Non-Cultivation System?'" I inquired. "*Give Nature a chance!*" was his instantaneous rejoinder. "In following standard practices, we spend most of our time and effort in defeating our objectives. We 'nurse' the trees to death!" And I thought of E. H. Faulkner's classic statement, that in modern agriculture "*we create our own problems for the doubtful pleasure of solving them.*"

Frank Hinckley, to use his own words, "was born under an orange tree." His father was a "grower" and followed all the "orthodox" practices of his neighbors. Even as a boy Frank began to question some of the methods his father was using. He made up his mind that when *he* had a grove of his own, things would be done differently; and consequently as a young man he began to experiment with various "unorthodox" practices. His rebellion against "orthodoxy" had begun. However, he was just feeling his way along the "highway" to better and more productive trees. Some of his experiments failed. Others showed signs of promise.

It was twenty-six years ago when Frank Hinckley purchased his first orange grove. His first ten acres, near the little village of Bryn Mwar, were half navels and half valencias. According to Hinckley, "It was a tough looking grove." It was an old grove even then, with twenty-eight-year-old trees that had been cultivated and fertilized and sprayed almost to death. "You could throw a hat right through any of those trees," he declared.

Young Hinckley was on the spot. He didn't know whether to tear up the old orchard and start all over—or to try and revive the dying, defoliated trees on his newly-acquired property. While trying to decide, he just did nothing. He quit cultivating. He quit fertilizing. And he quit cutting out the succor growth. He reduced irrigation to a minimum. In other words (although he didn't know it then) he was "giving the trees a chance" by letting Nature take her course.

Soon things began to happen in that old grove. The earthworms were moving in. With no heavy tractors thundering through the grove—no sharp discs to make "mince-meat" of these beneficent little "earthworkers", and with the leaves from the orange trees gradually forming a protective covering, and providing rich organic matter as food, the earthworms were multiplying in large numbers. The conditions in that grove were gradually approaching that of any forest floor, where God's little creatures are happy and undisturbed by so-called "scientific procedures", and incidentally, where health predominates.

For a time Mr. Hinckley was blissfully unaware of all this that was taking place in that red-clay soil of his farm; when one day he observed a slight movement of a leaf on the orchard floor. He looked again; the leaf continued to move. He picked it up, and there he found an earthworm that had been feasting on this bit of organic matter. He looked closely at other leaves. They also were moving! He discovered that they too were being devoured by these hungry little creatures, and were being carried down into their burrows where the tiny feeder roots could feast on this mineral-rich organic plant food.

From that memorable day—almost a quarter of a century ago—until now, no heavy machinery has passed through that orange grove. The "Non-Cultivation" method of citrus culture had come into being. Hinckley straightway sold his heavy farm equipment. He surprised even me by declaring that modern machinery in the orchard "is death to everything. My tools consist of a hoe, a rake, and a shovel. The earthworms are my *cultivators;* and they do a better job than I could possibly do with a plow, or a disc, or a harrow."

And apparently he is right; for while conventional methods almost ruined that grove by destroying the health of the soil and the trees, and reduced the size of the fruit and the crop—when the earthworms moved in and took over the job of cultivation, they nursed the trees back to health and vigor in a surprisingly short time.

In the "good old days" when "orthodox" practices were "the order of the day," there was a hard pan in that grove. "The water just couldn't get through to the trees," declared Hinckley. Now, thanks to the large earthworm population, all that has changed. The water goes right to the proper spot quickly through the millions of tiny channels made by the burrowing "earthworker".

Another important reason Mr. Hinckley gave for abandoning the plow, the disc, and the harrow, was the fact that deep cultivation, according to his observations, wrought havoc with the nutritional program of the tree.

You see, the feeder roots of an orange tree are very near the surface. They flourish in the bacteria-filled, mineral-rich topsoil. According to leading Agronomists, the life of any soil is in the upper four to six inches. When this topsoil is continually disturbed by popular methods of cultivation, the tiny feeder roots are damaged, if not entirely destroyed, and the tree suffers.

With the help of millions of earthworms the character of the topsoil in Hinckley's grove has almost miraculously changed from red clay into a rich black loam. This dark humus-filled loam, according to its owner, is now from four to five inches in depth. "How long did it take to bring up production in that old grove?" I inquired.

"There was an increase of $1,000.00 in the value of the crop taken off that grove after only one year of "non-cultivation" treatment," rejoined my newly acquired friend. "Since that time the average yield per acre has been 650 boxes, or 6,500 boxes for the ten acres. And there was no fruit drop, and very few splits."

And, believe it or not, those once sick, defoliated trees, with the help of the earthworms, put on so much new growth so rapidly that Hinckley had to cut out every other tree in the grove in order to give them room! Remember, when he purchased the grove all growth had ceased, and the trees were slowly "passing out." A year ago when Dr. Thos. J. Barrett, of the Earthmaster Farms, told me about this, I couldn't believe his story. But seeing is believing!

I was surprised also to learn that no leaves or organic mulches of any kind are brought into Hinckley's orchards and applied to the land. But on the other hand, every ounce of organic matter from the orchard itself is utilized. All the prunings—small branches and twigs are cut up with a pruning shears and left on the floor of the

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grove to help form an organic mulch. According to Hinckley, "Nothing is taken off—nothing brought in, except water, and a small amount of Ammonium Nitrate or Sulphate of Ammonia —about two pounds to the tree."

EDITOR'S NOTE: *It would seem to us that the trees would have just as successfully grown if the grower had gone the organic way 100 per cent, by supplying his nitrogen in organic form. In fact, we are sure that by this method, which is after all Nature's way, he might have had even better results yet.*

Recently some Government experts took samples of the soil in the Bryn Mwar grove. They found no deficiency in essential minerals in spite of the fact that little or nothing in the way of fertilizer is brought in and applied to the grove. These men marvelled that such results could be obtained on what they regarded as an entirely inadequate program of fertilization.

Once, long ago, just before a heavy rain, Hinckley placed some high-powered chemical fertilizer called Urea in the grove. Result: Millions of dead earthworms after the rain had put the stuff into solution under the trees.

"Do you fumigate your trees?" I inquired. "No indeed," was his quick reply. "Fumigation makes a mess out of your grove." "Does your 'non-cultivation' method require more water than the regular methods employed in other groves?" I asked. "Others use *more* water than I do, but the trees get *less* of it." was his reply.

"What about cover crops in the orange orchard?" I asked. "Cover crops take everything out—put nothing in," exclaimed this rebel farmer. "What's more, gophers clear out when you keep the orchard clean. As soon as a cover crop is planted the gophers move in, and how!"

In the beginning our revolutionary friend kept all the weeds down with a hoe. Today, however, he uses a light oil spray on the floor of his groves. That with the aid of natural leaf mulches does a good job of weed control.

EDITOR'S NOTE: *We are convinced that the oil method of weed control is not ideal, since the oil not only hurts the life of the topsoil but affects plant growth. If oil kills weeds, it also damages fine roots of trees. The mulch method is certainly preferable.*

My twin brother Henry and I visited two of Mr. Hinckley's now famous groves. And what a beautiful sight it was! The original Bryn Mwar grove is now 53 years old. For twenty-five of those years it had not been cultivated. The original irrigating ditches, made a quarter of a century ago, still carry water to these venerable trees. And what trees they are! They look more like adult English walnut trees than orange. Huge trunks, some of them measuring nearly five feet in circumference support mammoth limbs; some reaching up forty feet into the blue.

Not a blade of grass nor a single weed was in sight in that grove of giant citrus trees. Just row upon row of ancient ditches, most of which were lined with decaying leaves—and under the leaves millions of little "earthworkers". "I keep the soil moisture up mainly to support the earthworms," asserts Hinckley. "If you take care of the worm, the worm will take of the tree; and the tree will take care of you."

And Mr. Hinckley ought to know what he is talking about; for this philosophy of orcharding has made this pioneer organic gardener a wealthy man. He now owns three fine groves, with a total of well over forty acres. His oranges are bigger, of better quality, and there are more of them than in the surrounding groves, and he accomplishes all this at a fraction of the cost.

You don't have to ask Mr. Hinckley, "Do organic gardening practices pay?" Just look at his record, and then look again at those fruit-laden trees! If that won't convince you, Gabriel himself and his trumpet would have difficulty in waking you up!

Spiraea arguta McFarland

What Is A Shrub?

By J. HORACE McFARLAND

As a boy whose eyes and fingers and nose were wandering freely, I first though of a thing called a "shrub" as a very sweetly fragrant early spring blossom which if I warmed it in my hands would be pleasant to have about. I didn't think of shrubbery as such, distinct from trees or vines or roses or herbaceous plants or any other of the forms in which the soil works up what we like or don't like, as in the case of weeds.

Then came a time when I began to be in a nursery owned by my father, and my first knowledge was of the trees we sold. A good healthy one-year-old peach tree ready to put in the ground could be taken away from the nursery for fifteen cents, and for twenty-five cents one could buy a young apple tree. Pear trees were much more extravagant, and cost sometimes fifty cents, and from that up—but not much up.

Then the ornamental side of the matter separated itself into spireas and deutzias and lilacs, together with other plants which the botanist now calls shrubs, and which, because they lose their leaves in winter, are called deciduous, although some of them not so denuded by the frost are evergreen. As I came to know more of these and to realize the difference between them, estimation for them grew very greatly. It is but just to say, however, that

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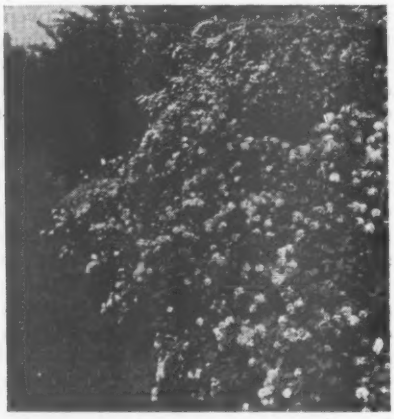
thirty or forty years ago the available variety of these shrubs was not large. We did have lilacs and spireas and deutzias, but not many others. When Hydrangea "Peegee" (which is the nursery designation for *Hydrangea paniculata grandiflora*) came from Japan, it really made quite a sensation because it was easy to grow, made a fine bush, and eventually produced the sorrowfully sour pink blooms that hang over into winter after they should have been removed.

I think too there were a few altheas, as they were called, which grew relatively tall and had showy flowers in the late summer. Likewise there were "snowballs," as we called them, mainly another form of one superb family I did not know the name of, but now greatly esteem under the name viburnum.

After a time the lilac knowledge separated, because some came into commerce which were called French lilacs by reason of their Gallic names. It took a dozen years for us to realize that the common and lovely lilac of spring which manifested the color we know had a white variety of merit, while these others which we came to call lilacs gave us many shades of blue that were not blue, many pinkish shades that were near pink, rich dark

Spiraea Thunbergi McFarland

blues, and beautiful pure whites. Meanwhile American people who wandered about in Europe, and that great Englishman, E. H. Wilson, who made three trips to the back of China with his eye out for plants, began to send us a great variety of shrubs, and these form much of the background of what we call ornamental planting today. It is of these, obtainable from nearly every nurseryman in small variety, that I wish to speak from the standpoint of wise selection. Some of these shrubs are of low stature and others form small trees, and indeed large trees if encouraged to that end. If we buy these things from an agent who has pretty pictures in his plate book, and carefully avoid reading in any of the admirably edited magazines that are available, we can surely so handle it that the planting about the home is not a planting but a mess. It is not difficult to discover that certain of the shrubs need to be in the sun while others prefer a little shade. Some are broad and others are slender. Some bloom very early and some very late. If one looks at the matter thoughtful-



Spiraea chamaedryfolia McFarland

Spiraea Menziesi McFarland

ly in designing the planting of a home, he comes to a desire to have some shrubs of stature and size there to screen certain parts of the premises, or to distinguish them. He wants other shrubs where they will stand out because of the beauty of their bloom, or indeed the beauty of form they adopt. That is where magazines like Organic Gardening become doubly, trebly useful, because they teach by indirection the kind of agreeable designing which makes the home surrounded by shrubs look as if it just happened so. There comes to my mind a remembrance of a home visited in the Lebanon Valley of this beautiful state of Pennsylvania, which was distinguished because the owner evidently had fallen violently in love with the plant first above mentioned, Hydrangea "Peegee," and he had planted a full dozen of them in his comparatively small front yard. All of them having grown so that he really had a "Peegee" wilderness. It probably pleased him, and it surely amused the passer-by.

It is entirely possible to have too much of a good thing. If the planter had dipped into it deeply enough he would have discovered that there are other hydrangeas than "Peegee" that are quite varied in time of bloom, considerably varied in character of flowers, and always graceful. Reading the publications referred to, and talking with an honest nurseryman ought to inform the interested planter on these matters, and he will do better indeed if he forms his own idea as to what he wants, and plants into it. It ought not to be done all at one time. He will find himself interested in the background where something needs to be displayed or concealed. He will know that smaller, lighter, less conspicuous items can front and even intersperse these taller shrubs, and thus he can get something that looks like the beautiful woodside he has sometimes enjoyed in his travels.

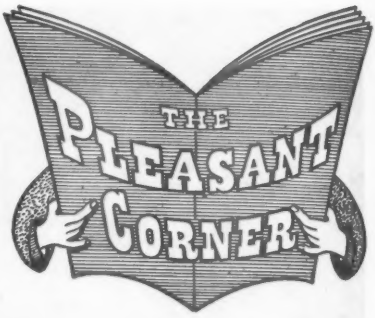
Aside from the actual named flower part of the situation that he is intending to create, he may to advantage consider the historical part. If he is a Pennsylvanian he will know that the laurel—which is not a laurel but more nearly a rhododendron along with its *rhodo* brothers,—belongs in this state; that superb and permanent effects could be had winter and summer if he

Spiraea van Houten McFarland

plants what he likes in sour soil and hopes for the best. He may even want roses, which are scarcely shrubs as such but are used in the shrubbery by those who train them on stakes to afford a certain grace in effect not obtained any other way, and giving the brilliance of form characteristic of the rose in June with an orderly shrub which will persist until Jack Frost takes charge

This aspiring planter may even in his woods walks chance upon forest gems he would like to have, and he may get some of the plants that clothe the floor of the forest. These words are written just after Christmas, and my eyes are full of the beauty of a little vase in my home into which have been thrust several plants of the red-berried *Mitchella* which we commonly call partridgeberry. They may not grow vigorously after they are taken from their vase environment, but they have paid their way by the green and the red between the leaf and the fruit which makes them remind us that there is always a spring ahead even if it is winter now. The investigator will find a half-dozen such plants that will be useful to him, and if he gets the garden impulse he will discover that he can paint pictures with plants, keeping always in mind that if he can once make a plant grow it will keep on growing; and he needs to consider always some years ahead, cultivating a willingness to pull out as well as a willingness to put in.

Now what I have thus written about shrubbery is not intended as a set of directions. I have not touched upon the necessity for having good garden soil and of managing to have it sweet or sour—that is, acid or alkaline—as the plants need. I have insisted that the shrubs one does plant in this garden can reflect his personality most admirably and pleasantly. He can make his own mistakes. He can see what his neighbors have done and can bring forward eventually something which is peculiarly and desirably his, and not an imitation taken from anyone.



EARTHWORKERS?

I've plans to start an earthworm farm. My friends tell me that California raised worms will make holes big enough for fence posts.

W. T., Galveston, Texas

—o—

A New York gardener went vacationing in the South. He admired the beauty of the Rio Grande Valley in Texas. "What terrific grapefruits!" he exclaimed.

"Grapefruit?" the Texan replied, "those are our smallest limes."

"And what are those enormous palms here?"

"Enormous? Heck, that's our kindling wood."

Then they came to the Rio Grande River and the New Yorker glanced at it: "I see, somebody's radiator is leaking."

After *Seed World*

—o—

WE AND MARRIED LIFE

Organic Gardening is a gem of a magazine and so vitally interesting that my husband and I find ourselves minus household etiquette, enthusiastically jerking the magazine away from one another. On more than one occasion he has "chased" me "around" the house forcibly taking away my—our—Organic Gardening in order to read some article first. It's all in fun but he does "acquire" the magazine *first*—he's stronger. Runs faster, too. So help me, I'm just stating facts.

Reader's name withheld

Milwaukee's Wastes Are Not Wasted

By CONAN BRYANT EATON

ONE-hundred-and-one years ago, when Milwaukee was incorporated as a city of twelve thousand people, its commercial and household wastes for the most part went into the ground—actually not *waste* at all. What little remained was dumped into rivers that carried it into Lake Michigan. Since drinking water came from wells and springs, there was little menace to health.

Today, metropolitan Milwaukee's sewage is largely returned to the soil in the form of neatly packaged fertilizer; what remains to be discharged into Lake Michigan is clear, sparkling water, free of harmful bacteria.

Between these parallels that span a century lie years in which the growing city and its suburbs daily befouled the rivers and the big blue lake in the front yard with millions of gallons of commercial and household refuse, prodigally wasting valuable organic matter, menacing the water supply that now came from the lake, ruining bathing beaches, and in warm weather assulting the nostrils of the population. By 1913 it was too much; Wisconsin's Legislature authorized a Milwaukee Sewerage Commission, which built, the following spring, a testing station at the rivers' mouth to try out all known methods of sewage disposal.

Eventually Milwaukee's engineers learned of an experiment in Manchester, England, in which sewage was treated by aeration. From this the Commission finally developed the Activated Sludge method of sewage purification. Milwaukee spent $600,000 in tests, and in building a large trial system, then it built and placed in operation in 1925 the world's pioneer Activated Sludge plant. This plant has operated continuously ever since, and with an extension built in 1935, it now treats 125 million gallons of raw sewage daily, drawn from an area of 152 square miles populated by three-quarters of a million people. Today, about half the cost of operating the Milwaukee disposal plant is paid by the sale of the 50,000 tons of fertilizer it produces annually. (In other locations and under different market conditions, this figure might vary greatly.)

To gardeners, this usable product is of prime importance. Every twenty-four hours Milwaukee produces 145 tons of granular fertilizer (sold as Milorganite) which analyzes 6% nitrogen, 3% phosphoric acid, plus a trace of potash. Moisture is below 5%.

Compared with common inorganic fertilizers, Milorganite breaks down and leaches out much more slowly. Some users, among them several golf courses and market gardeners, have reported valuable operational savings through application once-or twice-yearly, where inorganic materials had required application in smaller quantities several times yearly. Being completely organic in origin, Milorganite seems free of the tendency often complained of by farmers and orchard men to "make the ground get like concrete". It tends, in fact, to improve the texture of the soil.

No ground limestone or chalk is added to the dried sludge in the Milwaukee process. Even if desirable, such addition might involve legal complications, since the Sewerage Commission is actually empowered primarily to treat sewage, not to engage in competition with private enterprise. Other localities planning similar disposal plants would do well to clarify this point before making final decision on methods and end-product.

In the matter of using the Milwaukee system as a model for other municipalities, John H. Fowles, Assistant to the Chief Engineer of the Milwaukee plant, recommends caution. Local conditions differ greatly in the type and composition of industrial wastes, he says. These differences, as well as others, might require important de-

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partures from the Milwaukee method.

The city's pioneer system, however, is no secret. As Mr. Fowles describes it for the layman, raw sewage from the entire metropolitan district flows continuously into the plant, located on an isthmus in the harbor at the river's mouth. Coarse screens remove sticks, rags, and other large, bulky objects. Grit chambers settle out mineral particles such as sand, gravel and cinders, then fine screens remove small fibrous materials such as fruit peels, grain and leaves, which are incinerated along with the larger indigestibles. The screened sewage flows to a mixing chamber, where there is added to it 25% by volume of activated sludge taken from the purified sewage farther along in the system. This 25%, acting somewhat like yeast in bread dough, begins the bacterial action necessary for purification.

For six hours the sewage flows slowly through aeration tanks in which air at ten pounds pressure rises through porous silica plates in the tank bottoms and is diffused through the sewage. Then settling tanks allow the sludge to settle out of the purified sewage. Part of this sludge (that 25%, remember?) is diverted back to activate the incoming raw sewage. The balance is dried and sold as Milorganite. Into Lake Michigan goes the clear, harmless effluent.

In arid sections of the American west, this effluent might profitably be used for irrigation, since it contains the same percentage of nitrogen as does the sludge before it is dried for fertilizer. This use, of course, would be alternative to the possibility of feeding water plants for composting on the materials dissolved in the effluent.

Since it does not use the digesting process which Sir Albert Howard mentions as being used at Dartford, Milwaukee's plant produces no methane for fuel. This is offset by the improved quality of the fertilizer produced under the Activated Sludge process.

Milorganite, selling currently for $26 per ton, seems somewhat too valuable for large-scale composting, though home gardeners might use it for this purpose, adding ground limestone to suit their needs.

Users of Milorganite (chiefly market gardeners in this case) have frequently reported that under careful tests this organic plant food has shown added vegetable growth, compared with an equal investment in common inorganic fertilizers. This is in addition to such benefits as slower breakdown and improved soil texture.

At least one other large Wisconsin city develops a usable product from its sewage. Madison, the state capital, operates a trickling filter plant which treats about one-third of the metropolitan district's sewage, and an activated sludge plant which treats the balance. The air-dried granular sludge is sold locally; it contains on a dry basis about 3% nitrogen, ¾ to 1% phosphorus, and 50% humus. This is the natural product of the works, and no attempt is made to alter its chemical balance for commercial purposes.

It is interesting to speculate on what might be done by a city like Chicago. Basing our dream on Milwaukee's figures, we may picture the sprawling Illinois metropolis and her little sisters producing well over *a quarter of a million tons* of humus-laden organic fertilizer yearly, and scattering it like a benign goddess of fertility over the deep, flat, hard-worked lands of Illinois, helping them to soak up rainfall, to produce even bigger crops of corn in their cultivated years and greener grasses and legumes when their rotations wheel through the years of covered ground. (And Chicago's dry-throated cry for more Lake Michigan water to flush her toilets down the Mississippi might cease!)

Perhaps some day soon, urban Americans will fully awaken to the needs of our nation's soil—chiefly its desperate need of help in maintaining itself as a fertile, living base for *our* future life. Surely we may hope that then many other populous districts will follow the lead of Milwaukee and return their wasted plant foods to the hungry land.

Tomorrow's Food

Review of the Book *Tomorrow's Food* by James Rorty and N. P. Norman, M. D. (Prentice-Hall, 70 Fifth Ave., New York City 1947 $3.50.)

—

Health books do not, as a rule, form part of my reading diet. But in order to qualify for a reviewer of this book I might say that hundreds of pre-med students have gone through my classes and are probably not the worse off for it. The trouble with nutrition experts is that you find at all times suitable authorities for either side of a controversy. Thus, when I received *Tomorrow's Food* I made up my mind to be particularly cautious, since I know and like one of the authors and since I have the same publisher for one of my books. After this introduction, I can truthfully come to the conclusion: This is one of the most readable books I have ever read and one that will do an immense amount of good to health-conscious people.

The authors have no axe to grind and are not connected with any industry, not even the health food industry. Mr. Rorty is, of course, well-known for the charm and brilliancy of his writing and for his delight in debunking falsehoods. If there is a successor to Mr. Nock, Rorty is the one. A merely startling book is apt to become tedious for an intelligent reader, but the authors have been preserved from this danger by their well-balanced approach. They make a very good team.

The most startling thing I have come across during the last two years was the approach to DDT. Its danger is known. The fact that it becomes absorbed by skin and other tissues is proved. It has been shown that rats died when they were fed milk from DDT-sprayed cows. Yet, and that is the most incredible feature, the Government released DDT to interested industries who now advocate the use of the poison in dairy barns.

This pattern of incredible stupidity, lack of character, business enthusiasm, yielding to money interests or whatever the underlying fact, is exposed repeatedly in this book. The most startling feature was the weakness of Government scientists in yielding to the milling interests who advocate white flour, as described on p. 67. But this seemingly incredible picture of scientific weakness is inevitably connected with the nature of research: A scientist conditions his findings to given and clearly stated premises. Once he gets beyond this field of conditional truth he is just as foolish as everyone else, if not more so; for specialization and authority in a restricted field rarely foster the development of commonsense.

An interesting example of this is the report on the nutrition expert in the Office of Experiment Stations who stated that the belief in the goodness of fresh fruit and vegetable was just a left-over of old superstitions. Nevertheless, this expert was in his day just as convinced of the truth of his opinion as the experts of our age are convinced of the opposite. That is the trouble with all books of this type—they must rely on one kind of expert to refute another expert. The inventors of the irradiation process and the chemists who made synthetic "vitamins" were sure of adding valuable bits to our diet. Those who fortify white bread probably felt that, by having a good advertising approach, they would at the same time make up for the loss that occurs to the food values of grains treated by modern milling methods, while supplying the millers with a wonderful side income. But now we discover that vitamins in synthetic form may be extremely dangerous to our health. Where is the truth? The authors are not philoso-

phers, they are reporters of other people's findings, and even give a third possibility: When tests were run on a group of students, some getting vitamins, others pills without any value, the result was approximately the same for either group. Well then, are fortified foods healthful, dangerous or useless and innocuous?

This is where, in my opinion, the practical value of this book lies—it emphasizes the value of natural food. It doesn't advocate nuts and roots, meatless and sugarless diets, saltless and fruit foods; it merely comes to the normal conclusion that natural foods are sound. It debunks the health racket just as much as the chemical industries and their lucrative methods of scaring people into buying unnecessary additions. The authors arrive at their results by statistical data, by historical and anthropological analyses, by a strict emphasis on how mankind managed to be healthy and an investigation of factors that changed the picture to the present state of poor health, deficiency disease, draft board rejections, etc. Sir Albert Howard and the methods of Organic Gardening get their due share of emphasis.

The health-conscious housewife and student will additionally benefit by Dr. Norman's appendix—how to eat sensibly without vitamin charts. There is only one addition I should like to make to it and I can speak as one who never had any illness at all, not even the supposedly necessary children's diseases, nor was I rejected by my draft board. Whenever someone wants to sell me something good for my health I wonder whether his concern for my well-being may not include some concern for his own profits. True, sometimes a thing may be good for both parties, the producer and the consumer, but as soon as there is an excessive pressure one way or another, I am sure that it is not good for me—Then I go out in my garden and look at my own cabbages and carrots and am glad that my wife knows how to bake a good loaf of rye bread.

Heinrich Meyer

You Can Help The Organic Cause

You can help by handing out our subscription-getting booklets to gardeners in your community. Even neighbors, co-workers, fellow members in your church, clubs and organizations are prospects. They will thank you for giving them this booklet, for it may be the means of converting them into successful, organic gardeners. It will show them that fertile soil is the foundation of healthy crops, healthy live-stock and healthy human beings. It points out the folly and dangers of using chemical fertilizers.

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Stapelia flower — Wayne Winters

Odd Cactus Flower

By JEAN McCALEB

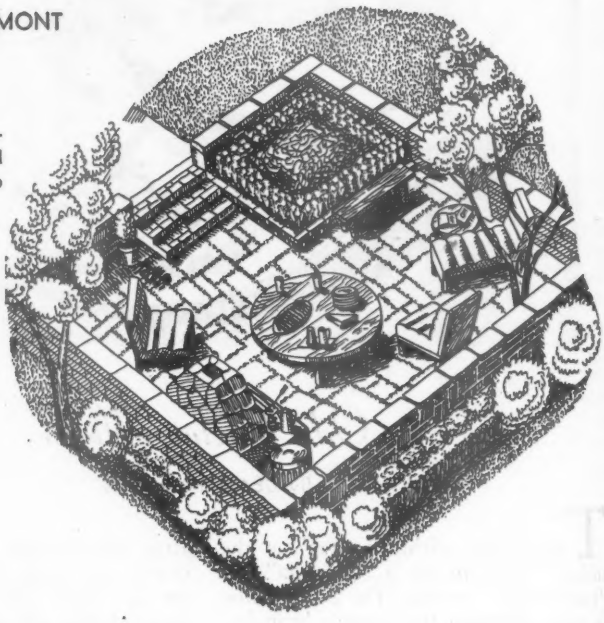
THE "star within a star" is the unique blossom of a "stapelia", or "rattlesnake" cactus. The latter name is given because the sinuous branches of the plant trail over the ground in much the same manner as a snake writhing over it. One of the odd facts about this particular flower is, that it does not come from the arid regions of the Southwest, where such flowers are fairly common. No, this blossom was grown in Wyoming, where such a plant is indeed a rarity. It will be noted that the queerly-shaped specimen is symmetrical in every way, and that the smaller star has the same number of points as has the larger one. This is unfailingly true of all the cactus plants of the stapelia family.

The spiny, sinuous branches are succulents, and contain a small amount of water that might indeed look large to a starving man on the desert. Persons experienced in desert travel say that there is no reason why anyone should starve for a drink as long as there is a cactus plant in sight, (and there usually is). Just cut into the body of the plant and soon you will see beads of moisture forming. Of course some of the varieties store more water than others, and it is no uncommon sight to see certain types of the barrel cactus fairly bulging with excess moisture after one of the infrequent showers in the vast sandy stretches of the desert in New Mexico and Arizona. Squeeze the whitish pulp with your hands and soon you will have a refreshing drink for yourself or your horse. And look at your hands after you've refreshed yourself. Many types of cactus are a real beauty treatment for the hands, for they will be snowy white and soft after handling the pulp.

The value of the cactus as food, building material, drinking water, and for making candy can hardly be overestimated. Many birds know they are safe when they build their nests in the cactus branches and they can live on the tiny seeds and the fruits of some cactus plants. Pack rats, too, so common in the desert, will build up a home from cactus sticks.

The ability to store water shows how well the cactus has adapted itself to desert conditions. Archeologists, digging several feet into the sand, have discovered the roots of this amazing plant extending many feet into the sand, in search of moisture. The cactus of the desert is one of the commonest sights, but the one pictured here was grown in a pot. What a rare sight, to see its gorgeous blossom in the dead of winter!

By LAWRENCE LAMONT



Terrace with a barbecue pit and the table all set offers possibilities to the tired gardener.

GARDEN FURNITURE

MANY times I have been confronted with the problem of producing for a client the type of outdoor living-room which would harmonize with his house and social standing in the community only to discover that his wife or he had picked up a lot of novel ideas which were never discussed when the plans were first gone over.

Some of these after-thoughts if carried out would mean a complete overthrow of all the work which had gone before. A garden plan is worked out every bit as carefully as a house plan and its entire effect can be destroyed by adding to it hit-or-miss.

Garden furniture should by no means be left to chance. What can be more disturbing than a lot of varicolored chairs whose bright colors clash with the natural symphony of a well planned border of annuals or perennials. Every landscape architect works painstakingly over the problem of blending the colors, the texture, the relative heights, succession of bloom, the horticultural needs of the plants, which are the paints on his palette. All this time and effort can be undone in an instant.

I have found the best solution for the addition of furniture to the flower bed is to introduce a note of white. White is neutral. White light combines all the colors in the rainbow and for this reason does not clash with the

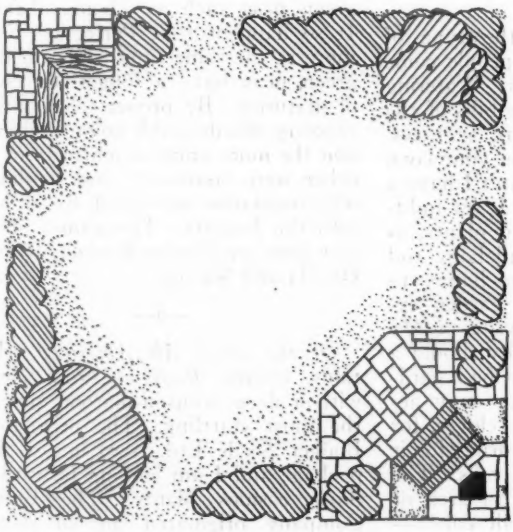
flowers. Another feature about white chairs is that it is much easier to be sure that they are clean. There is no danger of soiling one's clothing by sitting in a chair which looks clean but is not. This is quite important where outdoor furniture is concerned.

Green, which if it is a natural green, may be used very successfully as the color for the legs of these white chairs. However, chairs which are completely green have a false note as it appears that they are being camouflaged. Well-designed furniture need not be camouflaged and need not be smuggled into the picture. Good furniture well-chosen is as much a part of the outdoor living-room as the flowers themselves, and like a well-planned border they should be thought through so that they are in character.

Where the outdoor furniture is to be closely tied in with trees and large shrubs, the scale becomes larger and the light construction and the colors suggested above are out of place. Here we suggest heavier construction and a more subdued tone. Furniture done in the rustic manner or made of cypress, even pine with a walnut stain, is satisfactory. The brown forest color is more in keeping where the furniture becomes a part of the pattern with trees and shrubs.

On the terrace near the house where the evidence of man's handiwork predominates and the plant world plays a relatively minor role, garden furniture of a more elaborate design may be used. In some cases, when the architecture so indicates, even bright and gaudy colors may be perfectly in keeping. The architecture of the southwest suggests bright splashes of color.

With garden furiture as with everything else the rule should be, appropriation of selection and unity of plan.



A less presumptuous layout—the barbecue pit balanced by a stone bench, with shrubbery making the area private and cool.

by H. K. MEYER

Over the Fence

Albert Norman, rose hybridizer, writes in the March 1947 number of *Northwest Gardens and Homes* that he used to have great trouble with damping off of rose seedlings until he started sterilizing the soil. He adds, however, a remark which shows that this may become even more dangerous: "I find that great care must be exercised to see that the soil does not become reinfected or the results will be much worse than if it were not sterilized at all." He therefore uses new flats every year. Our contributor, Mr. Pfund, a wellknown Chicago nurseryman, found that the use of compst did away entirely with damping off in seed flats.

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Lawns are probably the type of garden with which most people come most frequently to grips. Watering and mowing or paying the bills of the busy yardman are as sure as taxes. Then you observe weeds in your lawn and are unhappy. Why can't I have a perfect turf? Personally, I am indifferent to a few unexpected plants, as long as they are not dandelions and plantains. I was therefore happy to see a wellknown English garden expert, Michael Vaughan, write in *My Garden,* March 1947: "Why should a few plants other than grass be regarded with abhorrence? They may actually be beneficial (white clover, for instance, in lawns which burn); for it is the general effect that tells. The lawn is there to provide an area of green—most soothing of all colors—and a few strangers among its grass seldom mar that effect." This philosophical attitude will allow a man to enjoy his lawn when a perfectionist attitude, contrary to all natural laws of mixed growth, must make him unhappy. Unless gardening can be enjoyable, there is something wrong with the gardener as well as with the garden.

—o—

Dr. E. M. Anderson of Rogers Brothers in Chicago has been active as a breeder of new peas for freezing. I learned from his article on the new introductions, one of which received an All American medal, that the canners seek peas of a light color, such as Perfection, while the freezers want dark green peas such as Thomas Laxton. It so happens that Perfection ripens more at the same time while the dark green peas have a longer succession of maturity. By proper selection and crossing, the desirable color of the one and the more uniform maturity of the other were combined, and hardiness, wilt resistance and good flavor bred into the bargain. The names of the new peas are Victory Freezer, Bonner, Oneida and Navajo.

—o—

Of the other All American selections, cosmos *Radiance,* rose-colored with a deep crimson-maroon zone, is the most startling. The originators, Bodger Seeds Ltd., sent me a trial package and I am looking forward to those cosmos plants. The Burpee Company originated an *all double ruffled petunia.* Formerly such seed

came from Japan, but during the last few years, one hybridizer set his mind to it and produced an equal in this country. He is going to continue with his breeding program and we may expect from his skill many other improved or startling flowers. Under natural conditions hybridization goes on all the time, but man, having learned the secret, can now speed up the process. There is nothing unnatural about hybrids, since you cannot compel nature to do something unnatural, you can only force it to produce the natural more frequently.

—o—

California Agriculture for January 1945 discussed and pictured the effect of organic matter placed on the surface in irrigation areas. A week after a heavy surface application of organic matter a piece of ground was irrigated. It took only 35 minutes for the water to enter the soil, whereas previously, without such a surface mulch, it took three to four hours for the same amount of water to become absorbed. Ammonium sulphate and some other commercials also have an adverse effect on water penetration. Before long, the growers who use oil for weed killing will start wailing too. What an intelligent man can anticipate quite easily those who advocate oil treatment are not apt to stress. But nature cannot be fooled.

—o—

Delphiniums are raised in America from seed, in Europe from cuttings. Nurserymen supply, of course, delphinium plants in this country too, but the delphinium has not yet fully reached the stage of the chrysanthemum—named varieties are not yet the rule of the catalogues. Here a great field lies ahead for enterprising nurserymen. In this connection we should also call attention to the success of the compost method, about which I reported in the latest yearbook of the *American Delphinium Society,* DELPHINIUM edited by Isabelle M. Wenk. In the same yearbook you will find a report by one of the wellknown growers, Jack Offerman of Seattle, Washington, many times a winner at exhibitions. He says: "For the past year I have been growing my Delphiniums in soil with compost as a fertilizer. I want to thank *Organic Gardening* for the excellent literature they provided which prompted me to try this type of humus-forming material, which I believe is the safest practice."

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According to Seed World, Dr. Parker of the Virginia Truck Experiment Station crossed collards and kale and produced a new vegetable, high in vitamins, that can stay out during winters and is sown in Virginia during August.

—o—

Mulching in Orchards, long praticed in various parts of the country and frequently; recommended by the New York Experiment Station, has been widely praised in the Northwest where a grower ceased discing and cutting the fine feeder roots of his trees and began to increase the humus content of the soil with all efforts. Even the pruned branches were returned to the orchard and now supply the trees with the very minerals that the tree had formerly picked up. Only, now the minerals are in organic form.

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The North Dakota Experiment Station reports in its *Bimonthly Bulletin,* January-February 1947 about residual effects of different fertilizer treatments, applied to old brome grass sod. Manure ranked higher than ammonium sulphate and superphosphate and a combination of these two. Another scientific proof for the strength of the organic position!

Disposal of Wastes, Needles, Leaves.

WHAT can a gardener do with pine needles? Can we use sawdust for mulching or should we compost the material? Can we put leaves into the ground without first composting them? These are a few of the questions that confront us through the year and to which simple answers can be given. A great amount of research has gone into the new booklet, *Organic Fertilizers,* which is to appear in June as the first issue of next year's *Gardener's Book Club;* but we wish to give here the principles so that the intelligent reader can figure out for himself what is involved in the disposal of various forms of organic matter.

Material of all sorts can be handled in three different ways—1. composting it 2. using it for mulching 3. putting it into the ground as it is. Sometimes all three methods can be combined; usually, one or the other is preferable in a given region. Besides, certain plants respond more favorably to one method than to the others.

All material can be composted provided that sufficient nitrogen and moisture are added and that in the early stage of decomposition air is supplied by funnels, turning, and proper mixing of materials. A heap of pine needles mats so much that air penetration is hampered; put in some fresh vegetable wastes or stalky weed material and air will come in. Make the layers of earth a little thicker in order to keep water from running through and off, and you make conditions better for bacterial growth. Use fresh moist manure instead of dried bagged material or apply the bagged material after you have let it soak for a day and you can get compost.

Can activators take the place of manure? It would not seem so, because manure is not only a rich natural source of bacteria, but also supplies nitrogen and hormones. The nitrogen is needed for growth food of the bacteria as they break up the plant material that supplies them with carbohydrate energy food. If manure is not available, use hoof and horn dust, dried or even fresh blood, leather dust, or any number of the nitrogenous materials that the new booklet lists. Dried poultry manure is also very effective and easily obtainable in the market; just be sure that the heap is thoroughly moist when you make it. Water will otherwise never penetrate and the bacteria and fungus spores will die from lack of a suitable medium. Activators may hasten the breakdown, but they cannot make up for moisture and nitrogen.

What about apple pomace, grape pomace, citrus peels in quantity? Is that material not too acid for the compost heap? You have probably had occasion to notice that the brown spots in an old apple or pear are not acid and tart, but very sweet. As fruit material starts rotting, the acids are broken up into their constituents and the material becomes sweet. The constituents are carbon, hydrogen and oxygen, all of which are perfectly safe. To further the rot organisms you can rely not only on the nitrogen addition, but also on the sprinkling of lime, which makes the medium suitable for the growth of desirable bacteria. The same goes for straw, pine needles, sawdust, etc.

Of the latter, we usually advise not to use more than 8 to 10 per cent of the total volume of the heap. Why? Because such material packs easily and then makes proper separation impossible. If you can mix a greater amount of manure in with pine needles or sawdust, if you interlace fresh green matter in quantity, you will nevertheless get good compost in time. It may take a little longer than if you used only fresh vegetable matter, grass clippings, and other substances that are already moist; for the sawdust, pine needles, dry leaves first have to soak

up water again before they can be worked upon by microorganisms. The organic compounds that occur in softwood residues, such as pine needles, fir sawdust and the like, are complicated and do not break up so rapidly; in fact, the resins may resist for long periods and turpentine can be used effectively not only to frighten bacteria away, but even to destroy them. In order to overcome that handicap you have to use other plant matter which gives the bacteria a good growing medium.

Using such materials for mulching is a different problem. One reader from the Southwest wrote that he mulched a garden with alfalfa hay, that the hay dried up and reflected the heat of the sun and caused burning of his plants. This is possible and can be overcome only by liberal use of irrigation, a matter that should be considered also in order not to create a fire hazard. A sawdust mulch is quite satisfactory in moist regions, especially under trees, shrubs, berries, but not for the garden. If you mean to use sawdust in the garden you must be sure to apply at the same time some source of nitrogen, let us say some bagged sheep, cow or poultry manure, if fresh manures are unobtainable, because otherwise the bacteria will work up from the ground and utilize soil nitrogen for breaking down the sawdust. That would deprive the growing plants of the nitrogen in the soil. The same would happen if you used a thick layer of pine needles; only there would be an additional disadvantage —pine needles may shed water rather quickly instead of absorbing it. By layering the sawdust and pine needles not only with manures but also some earth you escape that danger and further break-down. With dry leaves the problem is less serious and oak leaves will in a moist region at least, decay as well as straw or other recommended mulches.

Straw and salt hay are widely used, corn cobs have proved equally satisfactory in my own practice in Emmaus, around fruit trees, berries and ornamental shrubs. Obviously, in a dry region the matter is different and a supply of earth mixed in with the mulch material will bind the substance together and make work easier for the bacteria. Considering straw, hay and other dry materials, we should say that they are inferior to fresh green substances in more than the moisture-holding respect; young green plant matter is richer in nitrogen than strawy stalky material; it will therefore break down more quickly and thoroughly than straw and hay. To overcome this, add again some extra nitrogen in the form of fresh or bagged manures and possibly chop up the material so that it packs more easily. In making large amounts of compost commercially in Connecticut, we sent various types of straw and hay together with the manure through a silage cutter, wetted the output thoroughly and got compost within a record time. The home gardener cannot use such equipment, but he can follow the same principle and try to hold moisture by interlayering dry matter with earth and soaked manure.

This brings us to the third possibility, putting plant wastes into the ground without first composting. Again, much depends on the nitrogen aspect and the moisture. In a dry region you do not want to bury straw or leaves collected from your shade trees without thoroughly soaking the material first. In the moister Northeast, South Atlantic states, Northwest and Northern California and in the Gulf coast region, this precaution is not necessary; but you will here too recall that the bacteria need growth food besides energy food and that, therefore, you want to sprinkle manure, preferably rich poultry manure, on the leaves before turning them under. You rely in this case on the bacteria already in the soil or attaching to and living in the manure and leaves or even straw. That means that you cannot very well make a success of your garden if you turn under dry plant matter and then immediately plant a crop. In other words, turn

such stuff under at the end of the growing season.

Let me conclude with a personal reminiscence about my small Pennsylvania farm. When we bought it, my wife and I went out with the pick axe during March and April to get out the mallows and other weeds. For a hundred years or so the garden had been worked in the same spot where we found it, right next to the house that is over a hundred years old. The farmers had, no doubt, put in pig manure and other barn wastes; yet the soil was at that time like a piece of concrete. I wanted to play around also with the Chinese method of transplanting small grains, and we had to use the pick axe in order to make a dent into the ground out in the field where corn had been grown the previous year. Now, two years later, I could crumble the soil with my hand and push it away to see whether a hyacinth is coming up.

How did this improvement come about? First, I raised the beds and provided thereby for better drainage and aeration, even if the paths during the rains of the first year looked like canals. Second, I applied in fall, twice since I bought the place, about a bushel of well-made compost per square yard. This is an estimate only, but agrees about with the facts. Third, before applying this compost, I dug under at least a bushel of leaves with a few hands full of dry poultry manure, horn dust and bone meal (mixed) for every square yard. And fourth, I did all my spading and working in fall, giving the winter weather a chance to break up the material. This also makes it easier work, because fall weather is nicer than spring weather and because in spring all I need to do is rake the beds smooth and sow the seeds. After the leaves and manure were spaded under roughly, though deeply, I raked the compost in on the top; but I took care that the appearance remained cloddy. Nothing is worse than a finely raked seedbed made in fall. All it does is to keep the water from penetrating.

As some others have written us, the top mulch and leaf mulch method is suitable in California. I am sure that even there digging in leaves combined with some manure or horn dust or both will produce a loosening of the hard clays and adobes. The gumbo soils of the Gulf coast are black, but entirely without organic matter; they are hard to work and require enormous power, but I have managed to get into them by the same methods that have succeeded in Pennsylvania; one may have to dig gumbo soils on wet days in order not to break one's back or spade, but putting in sods, leaves and gin wastes has the same effect on a gumbo soil as on a clay or loam soil elsewhere. Adding a mulch will furthermore help, because it helps store water and check run-off.

Incidentally, Bermuda grass, so much hated in irrigation areas, makes an excellent compost if layered high enough and shaved at the edges. It decays readily with adequate moisture supply. I noticed this in making the paths between flower beds of turned over Bermuda sods. The lower levels broke down splendidly while the top kept on growing. It could easily be shaved off with a trowel since it was resting on a pure humus layer of great mellowness.

To sum up—take care always that plant material, nitrogen, moisture and air are present; take care that the breakdown takes place either above ground in a well-made compost heap or below ground after the growing season or on the ground through the mulching process. Mulches may encourage earwigs and sowbugs, neither of which does much damage to growing crops; they may also encourage snails and slugs, both of which must be trapped and destroyed if crops are to grow. But whichever method or combination of methods you use, always keep in mind that all living things need protein besides carbohydrates and that the bacteria therefore must be given some nitrogen source, preferably animal wastes, manures, horn, leather, etc., besides plant matter.

H. Meyer

Garden Calendar --- June

NORTHERN GARDENS: When *watering,* water well and rarely rather than often and superficially.

The summer *vegetables* are sown in open ground and succession crops of others may be started. June is the month in most states when lima beans, sweet corn, winter squash, cucumbers, fall celery, late potatoes and succession crops of collards, beet, carrots, kohlrabi go out.

The summer *annuals* can still be sown, but portulaca, morning-glory had best be first started now.

House Plants can be kept outside, especially cacti, fuchsias, geraniums. Tuberous begonias may be planted outside too. Put them in a cool half-shaded spot.

Bulbs that have ceased flowering need their leaves to store food for next year's blossom. If some tulips have bloomed poorly, divide the clusters of bulbs and start them out in a new spot. By setting them more deeply or covering the old bulbs with a new layer of soil, after the leaves have died down, you will get fewer offsets and better flowers. If you want to increase your stock, plant them shallow. By the end of June most narcissus bulbs can be replanted if so desired. Under average conditions, replanting is simpler and less dangerous than storing bulbs inside. *Dahlias and gladiolus* may still be planted.

Perennials may be started in seed beds or in specially prepared mixtures. I have had good results with delphiniums started early in the year, though commonly they are not sown until August. Some advise starting them in sawdust, others rely on compost.

Compost material is accruing now from the vegetable garden and the lawn areas. Make a trash pile and cover it roughly with earth until you have enough stuff to build a heap in one operation. Only then will good heating take place and only then will weed seeds be destroyed.

Prune *flowering shrubs* before they go to seed so that the plants are not exhausted and can make good flowers next year.

Lawns can be easily taken care of by an occasional hoeing out of undesirable weeds. This is so much surer, simpler, and safer than weed killing by chemicals. The grass will soon overgrow bare spots.

SOUTHERN GARDENS: Beans, cantaloupes, sweet corn, eggplant plants, okra, field peas, soybeans, sweet potatoes, squash and tomato plants can still go out in most states. Fall cabbage, carrots, rutabagas are started by the middle of the month in the middle South and in other warm regions. Along the California South Coast broccoli goes out, too, while beans, beets, carrots, radish, turnips, cauliflower, cantaloupes, celery, sweet corn, cucumbers, melons, peppers, squash and tomatoes may be continued.

Do not overprune climbers, but let all *roses* rest without feeding them and forcing them on through the summer.

Catch *slugs* under turned over grapefruit skins. Trap *sowbugs* under pieces of old board. For ant control in and about the house Magi-Kill and jelly may be used most successfully. It can be placed on small stones in little dabs and will then not contaminate your precious soil. It even controls the Argentine ant splendidly.

Please do not order these books from us.
Order through a book dealer or directly from the publisher.

Isaac Phillipps Roberts, AUTOBIOGRAPHY OF A FARM BOY. (Cornell University Press, Ithaca, N. Y. 1946. $2.50)

This book was written and first published in 1916 and has now come out in a new edition. Professor Roberts was born in Seneca County, New York, in the year 1833 and died in California in 1928. Thus his life comprises almost a hundred years, the years during which America grew from a poorly populated "colonial" country supplying the world markets with raw materials like cotton, tobacco, and, later, grain, to a highly industrialized land and the world's most prominent creditor nation. Roberts upheld during this period the idea of farming and the knowledge that, after all, our very existence depends on the farmer. Those who now go back to the country to find salvation from the intricacies of modern city life will not only relish the spirit of this autobiography, but they will also profit by the detailed bits of description and information. How the pioneers made mortar, what food was eaten on the farms, what nails cost in those days, how humus was preserved, how weeds arrived and were taken care of, how the first alsike clover sown had to be imported from abroad, etc.

"No one understood then and few understand now," says he, "that the difference between our outgo and our income was largely secured through parting with the unearned natural resources of the land, such as wood, humus, nitrogen, potash and phosphate of lime." Three times he moved westward to the enchanting new lands, but he returned and sums up his impressions that, to this very day, a young man could make a good living on the apple farm which saw his youth, depleted though the soil had become. The life at Cornell University, connections with the New York State Experiment Station at Geneva, and a quiet evening in California end the book after a description of his manhood years in Iowa. When he was recommended to a position at State College, one of the trustees, a physician, noted among other things for his strong language, said: "That pile of recommendations isn't worth a damn. I can get twice as many certifying that I am a good Methodist minister. Do you know this man Roberts and what stuff he is made of?" Apparently he was of the right stuff and people saw it, for he ultimately became the first dean of Cornell's school of agriculture, which has always remained among the leading and most widely useful institutions in the United States. A fine book, worth having. Very highly recommended.

Mary Deputy Lamson, GARDENING WITH SHRUBS AND SMALL FLOWERING TREES (M. Barrows and Company, Inc., 114 East 32, New York 16, N. Y. $2.75)

Mrs. Lamson is a trained and practising landscape architect of wide repute. Her new contribution to the growing shelf of extremely useful books on gardening published by M. Barrows and Co. will be welcomed by house owners and garden lovers all over the country, especially if they have come to appreciate the author's wide knowledge and gift of presentation from the many articles she contributes to magazines and papers. To show what all is contained let us scrutinize some of her lists: Shrubs for Winter color, with suggestions as to where to use what shrub. Shrub Values, giving the general foliage effect. Shrubs with Flowers, giving pages full of selections, of white, blue, red, yellow, pink, etc. blooming shrubs. Shrubs in fall color, describing foliage effect and general appearance after the leaves turn. And so the book continues, giving good advice on planting and soil treatment, acidity preferences, etc. Everyone should be able to make good use of it except the Southern gardener. Unfortunately the South is not represented and we suggest that the next edition contain two more chapters, one for the midsouth and one for the subtropical regions. Well recommended.

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Tomato Late Blight Again?

By B. F. LUTMAN
Professor Emeritus, University of Vermont

JUST about one hundred years ago, the potato fields of northern Europe and America were swept by a new, devastating disease which rotted the foliage and tubers. Since it appeared late in the growing season, it came to be known as the late blight and was found to be due to a fungus which had been named *Phytophthora infestans*.

The potato had been cultivated in Europe and America about 250 years without serious loss from disease. Then, this devastating blast came from out of somewhere and so completely ruined the potatoes that in some parts of Ireland, the varieties grown before the blight years were completely wiped out and are known today only by their names and descriptions.

The origin of this sudden epidemic has never been satisfactorily explained but it may be pointed out that it was timed to the introduction of chemical fertilizers into agriculture in 1846. Other suggestions have been made to explain this explosive outbreak, none of them entirely satisfactory. Very unfavorable weather in the form of a cold, cloudy, rainy summer had much to do with it, or at least aggravated the extent of the loss.

The tomato plant, a member of the same family as the tomato, the Solanums, was occasionally attacked by a similar fungus but the loss was comparatively small and never reached epidemic proportions. The fungus on the tomato, although exactly resembling that on the potato when they were examined under the microscope, was apparently slightly different in its habit of growth. It was what was known to special students of the fungus groups as a variety or "strain." Such a strain usually attacks one variety of plant more easily than it does its neighboring or related varieties.

Now, a hundred years later we have another epidemic of late blight but this time on the tomato plants. The season of 1946 was ideal for the development of the late blight fungus; again, as in 1846, a rainy, cool summer with a rank growth of foliage and a very late maturity of the fruits. The loss on the potato crop this season was not nearly as serious as in many other summers and the potato crop was so immense that millions of bushels found no market and have been thrown out in the fields to rot. On the other hand, from a third to a half of the commercial tomato crop was ruined and a majority of home gardeners had some blight or loss. The question that is puzzling all tomato growers today is whether a similar blow will fall on their tomato plants this year.

We must frankly admit in the beginning that we do not know how the tomato late blight carries over from one year to the next. The fungus, as it usually appears, is very susceptible to drying out so that some other stage or form must carry it along during the winter. One of the numerous suggestions that has been made is that some more resistant stage must carry it along during the winter probably on the tomato plant remains although possibly in the soil. While no such resting bodies have been discovered as yet, tomato plant remains must be under suspicion.

Another suggestion is that the disease is introduced each spring and summer from the extreme south, especially the southern part of Florida,

where late blight occurs all winter long on both tomato plants and early potatoes. Two theories are advanced to describe the progress of the fungus northward each season. One of these theories is that wind or insects carry the spores north as the season advances in a progress know as "hedge-hopping." Another theory is that some of the tomato plants grown in cold frames or in the fields in Florida acquire the disease from neighboring infected fields before they are shipped north every season to provide early tomato plants for the commercial regions of Pennsylvania, New Jersey, Maryland and Delaware.

During the last winter, late blight has been seen in gardens in Tampa Bay, Fla. but frost, during the period, February 2 to 11, had killed practically all the volunteer tomato plants that had come up and might serve as carriers for the disease. At about the same time, late blight was common on both tomato and potato plants in the Everglades.

Two strains of the fungus are known to exist; one destructive to the potato and the other to the tomato. But both strains may appear on the potato at the same time and in Indiana, both have been isolated from a shipment of Chippewa potatoes, presumably from Idaho. After isolation, they were inoculated back into potato and tomato plants and caused the two forms of late blight.

In view of all these facts and of our ignorance of the means by which the fungus is carried over from one summer to the next, what should the grower of tomatoes do in order to avoid starting the disease in his home garden planting of tomatoes?

1. Do not use tomato plant remains as humus unless they have been treated to the high temperature of a humus pile to destroy the fungus resting bodies if such occur. The recommendation given to use tomato remains on tomato plants should be withdrawn for the present until we know more about the late blight fungus.

2. Plant only sturdy, home-grown tomato plants that have been hardened off in cold frames. The tomato variety does not seem to matter so much since all the better sorts are susceptible under unfavorable weather conditions.

3. Avoid southern-grown plants. They are usually from cold frames or fields and have been stimulated to rapid growth by heavy applications of commercial fertilizers containing a generous dose of nitrogen. As a result, they are leggy and succulent. The absorbtion of large percentages of nitrogen compounds leads to a high-water capacity in such plants. They contain more water than plants grown normally and the late blight fungus attacks plants with a high water content more easily. Therefore, avoid such plants.

4. Do not fertilize the tomato plants too heavily even with humus in the hills. A heavily fed tomato plant tends to run to foliage of the susceptible type, while the poorly fed have samller, thinner leaves and are somewhat less susceptible.

5. Keep the plants off the ground as much as possible by carefully; pruning them to a single stalk by removing all side branches as they appear in the axils of the leaves. Tie this stalk up to a stout stake at least four to five feet in height. The pruning and tying up of the plants must be repeated a number of times during the summer but if persisted will result in a tall plant without too much foliage and with all the leaves off the ground. The infection begins on the lower leaves as a rule where the circulation or air is poor and the humidity increased from the soil. Such pruned plants have few leaves near the ground. They will yield, in spite of their slender growth, as many tomatoes as those that seem very much more vigorous.

Last year, following this method, the writer had, and without resorting

to spraying, an average of about 30 large sized fruit on his Marglobe plants and no blight although the disease was common in nearly all gardens around them. The season could not have been a worse one for disease and for the ripening of the fruit but practically all the fruit ripened and not a single late blight spot appeared.

6. After the last tomatoes are harvested this fall, put the tomato plants into a humus pile where they will be heated thoroughly. Of course they should not be turned under without treatment on any land that is to be planted the following year to tomatoes or potatoes. It would be better to play safe and even burn them than use them as untreated humus.

7. Hope for a better growing season this summer with more sunshine and less coolness and humidity.

THE NEW METHODS of soil testing for humus with special reference to the quality of compost and manure, as developed by Dr. E. E. Pfeiffer were reported at the Annual Meeting of the Bio-Dynamic Farming and Gardening Association, R. D. 1, Chester, N. Y., as held March 21 to 23 at Threefold Farm. Possible ways of educating farmers and gardeners by an "on the job" training program, were discussed at some length. There were lectures on Soil Conservation, Soils and Humus, Beekeeping and Dairying besides a number of brief reports from members on experiences in applying Bio-Dynamic methods on their places. A laboratory demonstration was given by Dr. Pfeiffer and his assistants. The group saw a working example of what can be done by the "Small Holder" on the 5 acres Mr. and Mrs. Heckel have been developing for 3 years. At the closing session Drs. Linder, Whitmont and Laskel led a symposium on "Health" as connected with food and soil problems. Of quite as much interest as the prearranged program, were the opportunities for discussion both between and during the sessions, at mealtimes and in walks about the Farm. The Association hopes to conduct a week's educational conference in September of this year, when there will be time for taking up many subjects that could be barely touched on at the meeting just held. These Conferences are open also to non-members and notice of them will be sent to anyone interested.

Lettuce-leaved Basil

By ARCHER P. WHALLON

IT IS not quite a lost art, but for a generation it has been a sadly reduced and neglected one—the art of cooking, canning and baking with home-grown culinary herbs rather than imported spices and flavors from the grocer's shelves. From the long list of plants familiar to our great-grandmothers, sage for sausage, and dill for pickles, are about all that survive in American farm gardens. Now, for the past year or two, there has been a modest revival of the ancient art. Several new books treating of the growing and use of the culinary herbs have been published: a New York Fifth Avenue department store opens an "Herb Farm Shop", selling imported English products at astonishing prices; and a Broadway actress starts domestic competition with her own "herb farm" in her native state of Kansas.

This is all quite as it should be; for while the cost of the commercial condiments, flavors and spices used by the ordinary family is small, and the monetary saving through the use of home-grown substitutes would not be important; their use would be to many an introduction to a new epicurean adventure in good living. Enterprising market gardeners will also find them a profitable side line. Particularly is this the case with the sweet basils and summer savory. These plants should be common crops in American vegetable gardens.

Should you notice the cans of Italian-type tomatoes (whether the product is Italian imported or Californian grown) you will probably read on the label—"Flavored with sweet basil"—so somewhere this plant must be a crop of some little commercial importance. And one of the varieties—the lettuce-leaved basil—ought to be regarded as a salad crop, along with lettuce, endive, cabbage and leaf-mustard; it is more than a mere condiment or flavor. This is the largest leaved variety, and may produce leaves three inches or more in length and nearly as wide. These leaves, when mixed with lettuce, cabbage, or other salad greens, are just what takes the product out of the ordinary class.

French and Italian seed catalogs list several varieties of the basils (*Ocimum Basilicum* and *O. minimum*) differing as to shape of leaf, size, and form of plant growth, including an ornamental purple leaved variety. But all the basils are pretty aromatic plants, and in Europe, they are frequently used as indoor pot plants. The flavor of all is about the same, and most everyone likes the spicy sweet flavor as an ingredient of a great variety of dishes. Basil grows well in any good garden soil, but does not stand hot dry weather very well. Good muck, suitable for mint, would probably be an ideal soil. The plant will stand light, but not heavy, frost. The leaves, when dried retain much of their flavor, and may be stored for winter use.

The summer savory (*Satureia hortensis*) is another garden spice plant that deserves to be restored to favor. The seed is very small, and I did not get as good a stand as with basil, though the plant is hardier, and will stand considerable hard frost.

Summer savory is a small branching plant, about a foot high, with fine foli-

age. This also gives a surprise flavor to salads, pickles, and canned fruits, though for most foods, I prefer basil. A combination of both, however, is excellent—very good in canned tomatoes. I have found a small yellow tomato, the "Golden Ball", bearing fruit an inch or two in diameter, which, when canned whole and flavored with sweet basil and summer savory, makes the best looking and the best flavored canned fruit that the garden can produce from seed in one season. Try this—if you want something different—that will win a prize at the fair, and make everybody ask for more at the table.

Co-op Members

MOST CO-OPS serve their members quite well. But how can they fill a demand of which they know nothing? Organic gardeners and farmers are advised to make use of their membership rights and to secure for themselves rock phosphate, colloidal phosphate (easily obtainable for feed mixing, but excellent for phosphate fertilization), ground limestone, dolomite, and other things recommended by *Organic Gardening* as good for the soil, the crops, and our health. When Co-ops go heavily into fertilizer factories, the organic members have an excellent chance to protect their interests.

With summer coming the home owner and gardener will again be faced with watering his lawns, gardens, and yards. A display of different sprinklers should be timely and helpful.

Sprinklers

IN the old days, the sprinkling can was the most essential help to the gardener. The commercial or professional gardener preferred the oval kind shown below, with the handle running in a smooth curve so that you could tip the can according to needs.

Next came the hose with the various spray attachments. There is fun in using it, especially if there are children about. They love to get a little shower. But with a large lawn hosing the grounds is too much of an imposition on the gardener's time. Thus, the canvas hose is practical, which allows the water to seep out gradually and to soak the ground thoroughly. The best looking type is the walking sprinkler, which guided by the hose moves along under the water's pressure without any human attention. In due time it will shut itself off and you can meanwhile enjoy yourself under your umbrella or bathing in the sun.

Special needs developed in city areas where the water supply is frequently limited during the hottest months. True, by proper choice of heat resistant grasses you can cut down on water requirements and on the water bill, but in the hotter parts of the country some watering is unavoidable. We all know that it is better to give the lawn one good soaking once every two weeks than a thin sprinkle every night. But how about trees and shrubs? Can you apply enough water to reach down through the parched soils to the roots under ground? One ingenious device helps out. It is made like a spear, that can be pushed into the ground; its ends are perforated and the water is forced out where it is most needed.

A border of flowers is usually hard to get into during the period of full bloom. Yet, sprinkling with standing pipes, overhead irrigation is not possible either, though such methods may be useful in a large commercial enterprise. The gardener or his wife resorts therefore to the hose. This is dangerous. The Zinnias, Asters and many other plants that are sturdy enough when left alone cannot stand much water on their leaves. A gray mildew and other fungus diseases develop rapidly as soon as the leaves are wet-

ted. To overcome these problems a new attachment has been introduced of late. It is fastened to the hose and can be handled like a hoe—you simply hold it to the spot which you want to water. Instead of getting washing of the soil, as happens when a hose is placed on the ground, the water is dispersed in such a way that it cannot produce a canyon in your flower beds.

The number of standing and rotating sprinklers is enormous. More and more large estates have resorted to permanent underground irrigation systems ending in sprinklers just at soil level. Even some city boulevards have been thus engineered. The method seems successful if I may judge from a few years of observation in Houston, Texas. The smaller place will nevertheless prefer the use of a rotating sprinkler that is moved according to needs. While more wasteful than the canvas hose method of irrigation, there is nevertheless something attractive about a lawn cooled by the moving arms of a well-designed bronze sprinkler.

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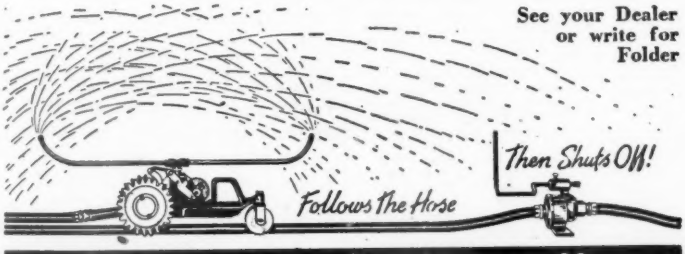

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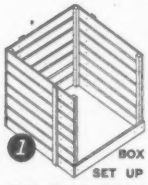

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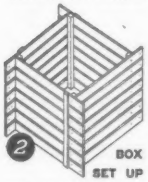

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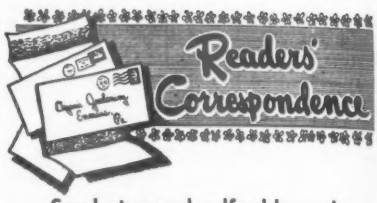

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HEALTH VALUE OF VEGETABLES

Q. Which vegetable is very high in vitamins?

Mrs. J. L. McK., San Jose, Cal.

A. Vitamin A is most abundant in the green leafy vegetables, such as beet greens, chard, turnip greens, mustard, spinach, tampala; vitamin B-1 is most abundant in the legumes of high protein content, therefore in lima and soy beans, peas, and also in beans. Vitamin B-2 is well represented in the leafy green vegetables, including the above-mentioned ones and kale. Vitamin C is particularly abundant in kohlrabi, cabbage, cress, etc. These also have goodly amounts of Vitamin G. Vitamin K again is well represented in the green leaves, but much less so in roots and seeds. Vitamin D is largely in meat and marine animals and in egg yolks, if the hen had a good diet. Small amounts are found in milk, cream, and liver, but fish is the best source. If you eat naturally without paying any particular attention to vitamins, but seeking out those vegetables that are tasty, and if you manage to vary the diet and now eat a few sprigs of parsley, now some savoy cabbage, now some endive, and if above all, you eat those vegetables without cooking them to a mush, preferably even raw and in agreeable amounts, fresh out of your well composted garden, you will get the necessary vitamins as a matter of course. On a mere vegetable diet, vitamin D might be difficult to supply; but by eating also nuts, whole grain wheat and oats, you cannot miss anything. I have never

eaten liver oil in any form and none of my ancestors have; yet my grandmother lived to be ninety-three without trouble, my parents are still alive and approaching eighty, and I have never had any sickness in my life at all and am getting ahead in years cheerfully. Don't worry about vitamins, eat what is good to eat from your garden.

—o—

ASPARAGUS BUTTS

Q. We can get asparagus butts from the cannery. Would they be good for composting? We are planning to grow asparagus for a local cannery.

S. R. O., South Haven, Mich.

A. Nothing could be more perfect. You feed your asparagus on asparagus compost and thus supply the very substance that make asparagus.

—o—

POULTRY DROPPINGS

Q. Should I use a smaller amount of poultry dressing than other kinds of animal manure in the "second layer"? I understand it is richer than some of the nitrogen producing materials.

Another question in my mind is, whether poultry dressing loses some of its "goodness" in being piled up waiting to accumulate enough to complete the size heap necessary to be effective? We have only 12 hens to produce the poultry dressing.

K. E. N., E. Hartford, Conn.

A. You are right. You can use a smaller amount of poultry dressing because it is richer in nitrogen. You might be able to modify our dropping pit method to save up poultry manure. In that way, your droppings would not deteriorate. If you cannot use this, you should use enough absorbent material so that the nitrogen does not go out. When there is smell, nitrogen is lost. By keeping the material packed and moist and throwing some sods on to the droppings, you can keep losses at a minimum.

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GLOXINIA

Q. How do I go about planting and growing gloxinias?

Mrs. J. G., Washington, D. C.

A. You order bulbs from your dealer, place them in five inch pots which are filled with soil similar to that in begonia culture, consisting either of sod compost with a sprinkling of bone meal or of an equal mixture of sand, well finished compost, and garden soil of a clay or loam type; to this you may add some bone meal if the compost was prepared without phosphate rock. Water well and then keep on the moist side without getting the soil soggy. Some gardeners like to put water in the saucer under the pot, but no such precaution seems necessary. Place pots in sunny window. You should get flowers in July or August. Keep reducing water after flowering, but never let the pot dry out entirely. The leaves will be partly or fully wilted by next February, when you can see new leaves sprouting. Then you resume heavier watering. It may be wise to take off some of the top soil and to add some fresh soil mixture around the tuber, but you may also use liquid plant food, preferably in form of compost water, to keep the plant fed in successive years. If the tubers do not flower the first year, the mixture is too rich, the tubers too young or the light conditions inadequate. You may pull off the leaves before they fully wilt and place them in a glass of water, where they will produce new small tubers and offsets. But the mother tubers which were thus deprived are thereby usually somewhat retarded; it may therefore be preferable to obtain fresh tubers if more plants are desired rather than to raise your own. Sod compost is made by letting sod layers, inter-laced with fresh manure, sit out for a year, turning or shaving off the outside twice. Use the material after at least one winter freeze has gone over it.

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ORGANIC GARDENING Emmaus, Penna.

WAXWORK

Q. We used to grow a plant called Waxwork, and I should like to know where I could obtain it. It had yellow blooms and later orange berries. It grew over an arbor in my grandmother's place.

J. L., Va.

A. Most of the advertisers of nursery stock in Organic Gardening will be able to supply Bittersweet or *Celastrus scandens,* which is also called Waxwork and answers your description. It is a native climber.

—o—

SALSIFY

Q. When is the time to plant salsify in Maryland?

G. L. C., Baltimore, Md.

A. Around the middle of April. But you may plant it till the middle of May. You harvest it toward the end of October.

—o—

Q. How shall I handle garbage in making compost?

A. M. M., East Texas, Pa.

A. Since garbage contains green matter mixed with animal matter, it should be handled a little differently. If it contains enough meat and fish residual value, it can be used practically without manure, but a little should be used because manure contains a lot of bacteria which aid the processes of composting. In such case use six inches of green matter and four inches of garbage, then about a half inch of manure. Then sprinkle lightly with earth and lime.

If the garbage does not contain animal matter, use six inches of garbage as the green matter, then two inches of manure. Then a sprinkling of earth and lime.

COMPOST QUIZ ANSWERS

1. *Wrong.* Use one part of fresh manure to three parts of plant matter.
2. *Wrong.* Fresh plant matter breaks down more readily.
3. *Wrong.* It is named after the Indian place where Sir Albert Howard developed his method and applied it on a large scale.
4. *Right.* Heating after the second turn is usually more pronounced than after the first.
5. *Wrong.* Acid loving plants want raw humus without addition of lime.
6. *Wrong.* In a well-made heap no grubs can live on account of heating.
7. *Wrong.* Bone meal is an excellent source of phosphorus.
8. *Wrong.* Superphosphate is made chemically by sulfuric acid treatment and is not recommended.
9. *Wrong.* A mere sprinkling is desirable for ordinary garden crops.
10. *Wrong.* While inside the heap mere sprinklings are correct, the outside layer should be heavier.

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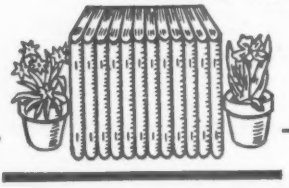

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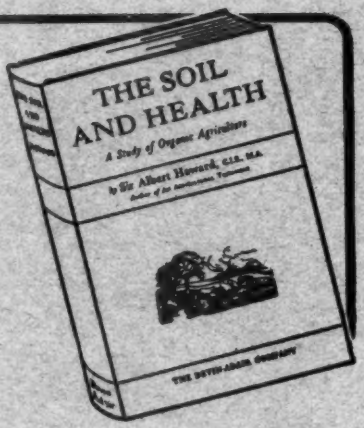

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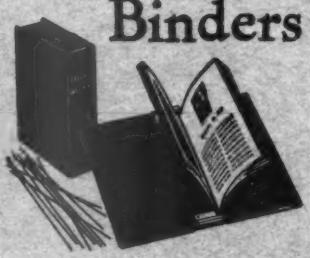

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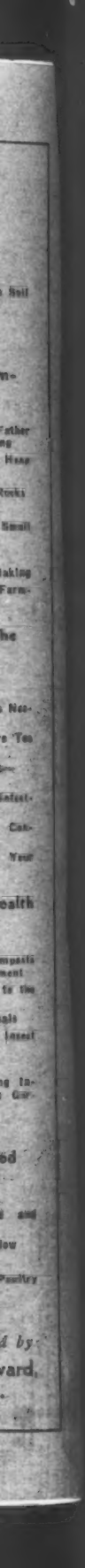
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